Arithmetic readiness in the kindergarten and primary grades

1938

BOSTON UNIVERSITY
SCHOOL OF EDUCATION
LIBRARY
Ed.
The Gift of Elizabeth Ray
Thesis
Ray, E.
1938

17059

Ed.
Thesis
1938
Ray
Stored

BOSTON UNIVERSITY

SCHOOL OF EDUCATION

THESIS

ARITHMETIC READINESS IN THE KINDERGARTEN AND PRIMARY GRADES

Submitted by

Elizabeth Ray

B. S. in Education

Boston University

School of Education

1936

In partial fulfillment of requirements of the

degree of Master of Education

1938

First Reader: Guy M. Wilson, Professor of Education

Second Reader: Mabel C. Bragg, Associate Professor of Education

Third Reader: Franklin C. Roberts, Associate Professor of Education

Boston University
School of Education
Library

Gift of E. Ray
School of Education
June 27, 1938
17054

TABLE OF CONTENTS

Title Page

CHAPTER I

Introduction 1

Aim and Importance of the Study 1

Evidence of Lack of Agreement 2

The Problem 5

Importance of Problem 6

Place of Present Study 8

Objectives 9

Previous Work 10

CHAPTER II

Developing the Test 12

Selection of Items in the Test 12

Form of the Test 12

Preliminary Usage, or Try-out 17

Directions for Giving the Test 17

CHAPTER III

499 Cases and the Results 20

Choosing the Point of Significance 20

Tables 29-143

Interpretation of the Data of Tables 41 and 42 149

CHAPTER IV

General Conclusions 150

1. Group on Counting 150

2. Group on Money 151

3. Figure Group 153

Digitized by the Internet Archive
in 2016

https://archive.org/details/arithmeticreadin00raye

TABLE OF CONTENTS, Cont.

Title Page
4. Informational Questions 153
5. Questions on Time 154
6. Miscellaneous 155
7. Questions on Number Recognition 155
8. Questions on Directions 156
9. Number Knowledge 157

CHAPTER V

Specific Conclusions for 75% of Right Answers 161
  Kindergarten 161
  Grade One 161
  Grade Two 161
Specific Conclusions for Change from 75% to 50% 163
  Kindergarten 163
  Grade One 163
  Grade Two 163

CHAPTER VI

Implications for Education 164
  Kindergarten 164
  First Grade 164
  Second Grade 164
Summary 165
Bibliography 167

List of the Tables, Exhibits and Graphs

Tables Page

I. Shows the number of children in the experiment. 29

II. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twelve boys in the kindergarten of Town A. 31

III. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by nine girls in the kindergarten of Town A. 34

IV. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by thirteen boys in Grade One of Town B. 37

V. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by eighteen girls in Grade One of Town B. 40

VI. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by nineteen boys in Grade One of Town C, School 1. 43

VII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty-one girls in Grade One of Town C, School 1. 46

List of the Tables, Exhibits and Graphs, cont.

Tables Page

VIII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty-three boys in Grade One of Town C, School 2. 50

IX. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty girls in Grade One of Town C, School 2. 52

X. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by ten boys in Grade One of Town D. 57

XI. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by eight girls in Grade One of Town D. 59

XII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by thirty-three boys in Grade One of Town E. 62

XIII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty-four girls in Grade One of Town E. 64

List of the Tables, Exhibits and Graphs, cont.

Tables Page

VIII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty-three boys in Grade One of Town C, School 2. 50

IX. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty girls in Grade One of Town C, School 2. 52

X. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by ten boys in Grade One of Town D. 57

XI. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by eight girls in Grade One of Town D. 59

XII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by thirty-three boys in Grade One of Town E. 62

XIII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty-four girls in Grade One of Town E. 64

List of the Tables, Exhibits and Graphs, cont.

Tables Page

XIV. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by fourteen boys in Grade One of Town F. 68

XV. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by fifteen boys in Grade One Town F. 70

XVI. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty-six boys in Grade Two of Town B. 73

XVII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty-four girls in Grade Two of Town B. 75

XVIII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty boys in Grade Two of Town C, School 1. 78

XIX. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by nineteen girls in Grade Two of Town C, School 1. 80

XX. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by thirty-eight boys in Grade Two of Town C, School 2. 83

XXI. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by thirty-four girls in Grade Two of Town C, School 2 85

List of the Tables, Exhibits and Graphs, cont.

Tables Page

XXII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by ten boys in Grade Two of Town D. 89

XXIII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by thirteen girls in Grade Two of Town D. 91

XXIV. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twenty-one boys in Grade Two of Town E. 95

XXV. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by thirty girls in Grade Two of Town E. 97

XXVI. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twelve boys in Grade Two of Town F. 101

XXVII. Shows the responses in terms of right, wrong and no answer on the sixty questions of the test by thirteen girls in Grade Two of Town F. 103

XXVIII. Shows a summary for Grade One, Town B in terms of right, wrong and no answers with their respective percents. 108

XXIX. Shows a summary for Grade One, Town C, School 1, in terms of right answers, wrong answers and no responses with their respective percents. 110

List of the Tables, Exhibits and Graphs, cont.

Tables Page

XXX. Shows a summary for Grade One, Town C, School 2 in terms of right answers, wrong answers and no response with their respective percents. 112

XXXI. Shows a summary for Grade One, Town D, in terms of right answers, wrong answers and no response with their respective percents. 114

XXXII. Shows a summary for Grade One, Town E, in terms of right answers, wrong answers and no response with their respective percents. 116

XXXIII. Shows a summary for Grade One, Town F, in terms of right answers, wrong answers and no response with their respective percents. 118

XXXIV. Shows a summary for Grade Two, Town B, in terms of right answers, wrong answers and no response and their respective percents. 123

XXXV. Shows a summary for Grade Two, Town C, School 1, in terms of right answers, wrong answer and no response with their respective percents. 125

XXXVI. Shows a summary for Grade Two, Town C, School 2, in terms of right answers, wrong answers and no response with their respective percents. 127

XXXVII. Shows a summary for Grade Two, Town D in terms of right answers, wrong answers and no response and their respective percents. 129

List of the Tables, Exhibits and Graphs, cont.

Tables Page

XXXVIII. Shows a summary for Grade Two, Town E in terms of right answers, wrong answers and no response and their respective percents. 131

XXXIX. Shows a summary for Grade Two, Town F, in terms of right answers, wrong answers and no response and their respective percents 133

XL. Shows a summary for the kindergarten children in terms of right answers, wrong answers and no response with their respective percents. 137

XLI. Shows a summary for all Grades One in terms of right answers, wrong answers and no response with their respective percents. 139

XLII. Shows a summary for all Grades Two in terms of right answers, wrong answers and no response with their respective percents. 141

Exhibit

I. Showing form of Arithmetic Readiness Test as used. 13

II. Showing the modified and recommended form of the Arithmetic-R-Test, rearranged after using the test on 499 kindergarten, first and second grade children and studying the results. 22

List of the Tables, Exhibits and Graphs, cont.

Graph		Page
I.	Showing percentages of right answers by grades on the sixty questions of the Arithmetic Readiness Test.	143
II.	A descending scale showing percentages of right answers to the Arithmetic Readiness Test for the Kindergarten.	146
III.	A descending scale showing percentages of right answers for the Arithmetic Readiness Test for Grade One.	147
IV.	A descending scale showing percentages of right answers for the Arithmetic Readiness Test for Grade Two.	148

PREFACE

The writer hereby acknowledges indebtedness to Dr. Guy M. Wilson for his advice, guidance and assistance in preparing this thesis. Without his untiring help and advice this thesis would have been impossible. The writer here wishes to thank him for all the time and help he has so unselfishly given to her.

CHAPTER I

INTRODUCTION

AIM AND IMPORTANCE OF THE STUDY. The present study, as indicated by the title, is designed to discover the elements of a test that will disclose the readiness of first grade children for beginning arithmetic in general, or for practical experience units. The study involves securing child responses to a sizable number of items, the careful tabulation of the responses, and then a study of the data in order to classify and evaluate for use the elements that appear most promising.

In other words, the problem is to discover a test or plan that will disclose which children are ready for the beginnings of arithmetic and at what point or through what units the beginning approaches may be made. Incidentally, this study will also make possible comparisons of children's attainments from various school systems, some of whom have no formal drill in grades one and two. By formal drill is meant the direct teaching of addition and subtraction as a drill subject and not by informational units.

If successful, this test will show children's arithmetical interests which may be used as a basis for the child's readiness. A child's interests focus around those things of which he has some knowledge.

CHAPTER I

INTRODUCTION

AIM AND IMPORTANCE OF THE STUDY. The present study, as indicated by the title, is designed to discover the elements of a test that will disclose the readiness of first grade children for beginning arithmetic in general, or for practical experience units. The study involves securing child responses to a sizable number of items, the careful tabulation of the responses, and then a study of the data in order to classify and evaluate for use the elements that appear most promising.

In other words, the problem is to discover a test or plan that will disclose which children are ready for the beginnings of arithmetic and at what point or through what units the beginning approaches may be made. Incidentally, this study will also make possible comparisons of children's attainments from various school systems, some of whom have no formal drill in grades one and two. By formal drill is meant the direct teaching of addition and subtraction as a drill subject and not by informational units.

If successful, this test will show children's arithmetical interests which may be used as a basis for the child's readiness. A child's interests focus around those things of which he has some knowledge.

There is now a general acceptance of the belief that we have been attempting to teach much of our arithmetic before the children were intellectually ready for it and without the aid of felt needs. The primary understandings of number meanings grow out of number experiences, and these experiences for children frequently lag far behind assigned tasks.[1]

EVIDENCE OF LACK OF AGREEMENT. There is, however, still a great deal of controversy on this subject. We find even in our progressive school systems that many curricula call for formal arithmetic in all the primary grades. We find children in grades one and two that are attempting to learn all the 400 addition facts, 100 subtraction facts, and the multiplication and short division of the first five tables, to say nothing of the use of the quart, pint, inch, minute, etc.[2]

We find also that teachers complain about retention in arithmetic. They feel that the child forgets all his arithmetic from one year to the next. It is a well known fact that we retain that which we use. If we do not retain those things we do not use, how can we expect the child

---

1. Gillet, Harry O. Foundations in Arithmetic Bulletin of the Association for Childhood Education, p. 3

2. Osburn, W. J. Corrective Arithmetic, Houghton Mifflin Company 1924

to retain those number facts which we teach him in the lower primary grades when he will not use them outside of the schoolroom?

Teaching arithmetic formally, or on the basis of systematic drill, in the first and second grade seems to be a waste of time. Children with no drill have come into the third grade of a school system which has the drill arithmetic from the first grade and within a short time after entering the class have been up with the arithmetic of that class.[1]

Washburne shows the futility of teaching children facts and skills which their immature minds are not naturally ready to learn.[2]

Smith found that but little of the arithmetic taught to children in the first grade is used by these children outside the schoolroom. Outside usage shows 35% in addition, 23% in counting, 12% in subtraction and 8% in fractions.[3]

---

1. Taylor, Joseph S. Omitting Arithmetic in the First Year. Ed. A. & Supr., Feb. 1916 p. 87-93
   Wilson, Guy M. New Standards in Arithmetic. J. Ed. Res. 22: 351-60 Dec. 1930. (Miss Greenwood's Experiment in Lawrence.)

2. Washburne, Carleton. When Shall We Begin Arithmetic Ed. School Journal May 28, p. 659-65

3. Smith, Nila. Arithmetic in the Out of School Life of First Grade Children. Elementary School Journal 24 p. 621-27

Caldwell finds that arithmetical problems that follow up situations that have been encountered during the summer are worthwhile.[1]

Hall has made a study of contents of children's minds on entering school.[2] He finds that there is next to nothing of pedagogic value, the knowledge of which it is safe to assume at the outset of school life. He also says that the concepts which are most common in children of a given locality are the earliest to be acquired. He found that children recognized small numbers, coins and could count to ten.

Harman has made a list of good arithmetic activities and experiences.[3]

Conners and Hawkins have made a study of what materials are most useful to children in learning to solve problems. They say: "The best materials for use in teaching problem solving in arithmetic seems to be problems selected by pupils themselves from their environment, to illustrate the processes they are expected to learn to

---

1. Caldwell, Alma Arithmetic Follows Vacation Interests American Childhood Ed. May 1935 Vol. XI No. 8 p. 344-47

2. Hall, G. Stanley Aspects of Childlife & Ed. Ginn & Co. Boston 1907

3. Harman, A. F. Working Arithmetic for Beginners, American Childhood Oct. 1932 Vol. 18 No. 2 p. 12

use in problem solving."[1]

Wilson says the child must have experiences which teach him the meaning of number. Meaningful experience units give zest to the work in arithmetic.[2]

THE PROBLEM. The problem before us is: How can we teach arithmetic so that it will be meaningful and will be retained? With this problem solved, much of the difficulty of arithmetic teaching would be overcome.

Many think the answer to this question hinges on the readiness of the child himself. Only that which the child understands and can use will be of any use to him. What does the child know of arithmetic? What numbers does he use daily in his work and play? How does he use them? Certainly before we give the child formal arithmetic, he must have some background, and that can't be acquired in a day or a week. The first two years of school should be spent in making contacts and laying foundations. The child has so much to do in these first years, it would be better if some of these things could be postponed instead of all coming together in the first grade. A staggered program would seem more profitable.

---

1. Conner, Wm. L. : Hawkins, Gert. C. What Materials Are Most Useful to Children in Learning to Solve Problems Ed. Method 16: Oct 1936 p. 21-29

2. Wilson, Guy M. Number Experiences in Grades 1 & 2 American Childhood Jan. 1936 Vol. 21 No. 5 p. 15

If the child spends his first year in school in building up number experiences along with the other curricula activities, he will come out better in the end. When the time for formal drill comes he will have experiences to base his knowledge upon, also he will be far enough advanced in reading, etc. to be able more easily to undertake a new subject.

Our question is, how can the teacher know where to meet the child in order to continue from there. Arithmetic, it is agreed must function in the life of the child by making him efficient in the quantitative situations which he will inevitably meet, and that is what is being attempted.[1]

IMPORTANCE OF PROBLEM. Jacobs says, "The tools with which to work must be chosen with the idea of social practices and understanding in mind." The combinations form a small part of a number program, for back of the combinations there must be a wealth of understanding else they become mere meaningless memorizations.[2]

Meumann says: "It is found that the number concepts of children just entering school show a wide variation in development..........This variation may be traced to pre-school

---

[1] Gray, Wm. S. & Freeman, F. N. Brownell, Wm. A. Trends in the Three R's. Vol. XIII No. 9 Childhood Education May 1937 p. 414-21

[2] Jacobs, Nina Personality Development and Adjustment Through Number. Childhood Education Vol. 13 No. 6 p. 258-261 Feb. 1937

If the child spends his first year in school in building up number experiences along with the other curricula activities, he will come out better in the end. When the time for formal drill comes he will have experiences to base his knowledge upon, also he will be far enough advanced in reading, etc. to be able more easily to undertake a new subject.

Our question is, how cem the teacher know where to meet the child in order to continue from there. Arithmetic, it is agreed must function in the life of the child by making him efficient in the quantitative situations which he will inevitably meet, and that is what is being attempted.[1]

IMPORTANCE OF PROBLEM. Jacobs says, "The tools with which to work must be chosen with the idea of social practices and understanding in mind." The combinations form a small part of a number program, for back of the combinations there must be a wealth of understanding else they become mere meaningless memorizations.[2]

Neumann says: "It is found that the number concepts of children just entering school show a wide variation in development..........This variation may be traced to pre-school

---

1. Gray, Wm. S. & Freeman, F. N. Brownell, Wm. A. Trends in the Three R's. Vol. XIII No. 9 Childhood Education May 1937 p. 414-21

2. Jacobs, Nina Personality Development and Adjustment Through Number. Childhood Education Vol. 13 No. 6 p. 258-261 Feb. 1937

influences."[1]

There are many other educators who support this idea.[2-3-4]

Buckingham says that the child does not come to school ignorant of numbers. His mind is not a blank with reference to quantity. His data show that most children have made progress in numbers through experience.[5] Through the present study this point will be brought out. Then, continues Buckingham: "Meet the child where he is. Don't meet him where you think he is. Know where he is. Don't meet him where he ought to be or where his mother says he is. It is important that there should be no mistakes about the interests and the abilities of the pupils whom we are teaching."[6]

Authors agree that mathematical readiness seems to depend upon the experiences of the child, his maturity and the nature of the mathematics. Therefore his interests which coincide with experience will easily link up with readiness.[7]

---

1. Meumann, Ernest 29th Yearbook of the National Society for the Study of Education

2. Thiele, C. C. & Sauble, June The Third Grade Masters Arithmetic Tables. American Childhood Vol. 16 No 9 p. 22 May 1931

3. Smith, Nila B. Elementary School Journal April 1924 p.621-626

4. Buckingham When to Begin Teaching Arithmetic Childhood Education May 1935 Vol. XI No. 8 p. 339-43

5. Buckingham op. cit.
6. Buckingham op. cit.
7. Sueltz, Ben. A. Arithmetic Readiness & Curriculum Construction The Mathematics Teacher Oct 1937 p. 290

They claim that two standards and only two apply to the grade placement of curriculum material, first, the child readiness, second, social usefulness.[1] Then "Pupil experiences provide the starting points for all lessons."[2] When this has been determined it will be a good basis for the work of the first and second grades.

In the Fourth Yearbook of the Department of Superintendents we read: "Arithmetic should be taught when the child has need of it and when he has the proper background of experience to profit by it. The available data relative to the question of starting arithmetic are incomplete. Arithmetic should be taught when the child has a proper background for it."[3] Some would add, "and sufficient use for it to make retention probable."

PLACE OF PRESENT STUDY. The present study is for the purpose, as indicated, of constructing a scale that will help in planning an arithmetic program adapted to the child. This proposed scale is designed to try and find out what experience basis for number knowledge the child has before being taught arithmetic. With this in hand the teaching can easily grow

---

1. Buckingham op. cit.
2. Thiele & Sauble Arithmetic Mastery for Advanced Third Grade.
3. Fourth Yearbook Dept. of Supt. quoted in the 29th Yearbook Nat. Soc. for Study of Ed. Sh. 2 p. 49 Social Value of Arithmetic.

They claim that two standards and only two apply to the grade placement of curriculum material, first, the child readiness, second, social usefulness.[1] Then "Pupil experiences provide the starting points for all lessons."[2] When this has been determined it will be a good basis for the work of the first and second grades.

In the Fourth Yearbook of the Department of Superintendents we read: "Arithmetic should be taught when the child has need of it and when he has the proper background of experience to profit by it. The available data relative to the question of starting arithmetic are incomplete. Arithmetic should be taught when the child has a proper background for it."[3] Some would add, "and sufficient use for it to make retention probable."

PLACE OF PRESENT STUDY. The present study is for the purpose, as indicated, of constructing a scale that will help in planning an arithmetic program adapted to the child. This proposed scale is designed to try and find out what experience basis for number knowledge the child has before being taught arithmetic. With this in hand the teaching can easily grow

---

1. Buckingham op. cit.

2. Thiele & Sauble Arithmetic Mastery for Advanced Third Grade.

3. Fourth Yearbook Dept. of Supt. quoted in the 29th Yearbook Nat. Soc. for Study of Ed. Ch. 2 p. 49 Social Value of Arithmetic.

out of what the child knows. Other investigators have found out that children possess much ability in the elementary processes of arithmetic even before the time of beginning formal instruction in the subject.[1-2]

With the results of this scale to work upon adapted arithmetic units can be chosen. Pupils'answers to questions will reveal his readiness or unreadiness for particular units. By starting a process when the child is ready for it and basing the work on previous experience the child has a much greater opportunity to succeed.[3-4]

OBJECTIVES. The following statement of objectives will unify the preceding discussion and point forward to the main study:

1. To disclose readiness of first grade children in arithmetic.
2. To note the number knowledge of children with formal drill as opposed to those without.
3. To discover children's arithmetical interests.

---

[1] Buckingham, B.R. & McLatchy, Josephine Number Abilities of Children when they enter Grade I. 29th Yearbook of Nat. Society for the Study of Education. p. 473-524

[2] Woody, Clifford Arithmetic Backgrounds of Young Children Journal of Educational Research 24: 188-201

[3] op. cit.

[4] Rich, Frank M. Project Arithmetic Small Numbers & Combinations American Childhood Oct. 1934 Vol. 20 No 2 p. 16.

out of what the child knows. Other investigators have found out that children possess much ability in the elementary processes of arithmetic even before the time of beginning formal instruction in the subject.[1-2]

With the results of this scale to work upon adapted arithmetic units can be chosen. Pupils' answers to questions will reveal his readiness or unreadiness for particular units. By starting a process when the child is ready for it and basing the work on previous experience the child has a much greater opportunity to succeed.[3-4]

OBJECTIVES. The following statement of objectives will unify the preceding discussion and point forward to the main study:

1. To disclose readiness of first grade children in arithmetic.

2. To note the number knowledge of children with formal drill as opposed to those without.

3. To discover children's arithmetical interests.

---

1. Buckingham, B.R. & McLatchy, Josephine Number Abilities of Children when they enter Grade 1. 29th Yearbook of Nat. Society for the Study of Education. p. 473-524

2. Woody, Clifford Arithmetic Backgrounds of Young Children Journal of Educational Research 24: 188-201

3. op. cit.

4. Rich, Frank M. Project Arithmetic Small Numbers & Combinations American Childhood Oct. 1934 Vol. 20 No 2 p. 16.

4. To obtain a basis for number units upon a meaningful basis.

PREVIOUS WORK. Dearborn and Peet measure the general ability of pupils in the first six grades.[1]

Mac Latchy, who has worked on the number abilities of first grade children finds that the first grade teacher can help most by answering questions, providing experiences, arranging activities and by offering suggestions of additional facts to be learned in a situation.[2]

Douglas has worked on the development of number concepts in children of pre-school and kindergarten age.[3]

Hildreth is one of the pioneers in arithmetic readiness and says that far too little has been done in the way of arithmetic readiness.[4]

Brownell, in a recent article, reports on the evidence of first grade inventories of number abilities of children on entering school. He says that children have learned so much about numbers on their own that they should be allowed

---

1. Dearborn, Walter F. Peet, Harriett E. 20th Yearbook Nat. Soc. for the Study of Ed. A Test in Arithmetic for Measuring General Ability of Pupils in the First Six Grades p. 601-11

2. Mac Latchy, Josephine Number Abilities of First Grade Children Childhood Education May 1935 Vol XI p. 344-47
3. Douglas, Harl R. The Development of Number Concepts in Children of Preschool and Kindergarten Age Journal of Exp. Psy. Dec. 1925 Vol 8 p. 443-70
4. Hildreth, Gertrude Arithmetic Readiness Journal of Exp. Ed. Sept. 1935 Vol. 4 No. 1 p. 1-7

to continue. This is a positive proof of readiness for direct teaching. He shows that children in grade one can learn arithmetic.[1]

---

[1] Brownell, Wm. A. Readiness and the Arithmetic Curriculum Elementary School Journal Jan 1938 Vol XXXVIII No. 5 p. 344

CHAPTER II
DEVELOPING THE TEST

SELECTION OF ITEMS. In preparing the test for this study the writer has tried to follow child leads. The questions have been selected from the children's environment and experiences. In the classroom all situations where any type of arithmetic was used were noted. There was a surprising number of situations in which arithmetic was used, and in which the children handled the situations easily and naturally. In the child's reading the cost of a circus, etc., may be brought up. The problem of milk money is quite prevalent. In many school systems the children have banking. With the Micky Mouse Watch so popular now a great many children are learning to tell time to show off their new watches. These things have all been considered in the making of the test.

It will be noted that there is a wide range of questions in the test. This was done purposely to try to cover many possibilities. Then those items which are valuable will be of further use while the others can be discarded.

FORM OF TEST The test is divided into nine groups. Each group takes up a different phase of arithmetic. The groups include counting, money, figures, information, time miscellaneous, number recognition, directions, and number knowledge.

EXHIBIT I Showing the Form of the Arithmetic Readiness Test as used

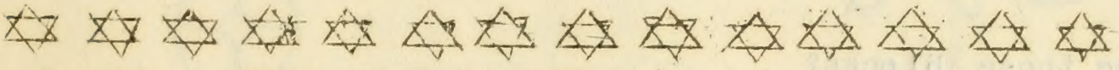
Name______________________ School______________________

Age______________________ Grade______________________

ARITHMETIC READINESS------------------INFORMATIONAL INVENTORY TEST-----------

COUNTING

1. Can you count to twelve?
Draw a line through 12 stars.



2. Make a circle around the sixth fish.

3. Draw a star on the second duck.

4. How many triangles are in the box?

5. Count by 2's to 30.

MONEY

6. How many pennies in a nickel?__________

7. How many dimes in a dollar?__________

8. Cross out the dollar mark

¢ % " $ #

9. If you go alone for an ice cream cone how much money do you take?

10. How much milk money do you bring?
Cross out the number.

5 10 20 25 15 30

11. Cross out the Red Cross money you bring with a star.

1 6 4 10 9 8 0

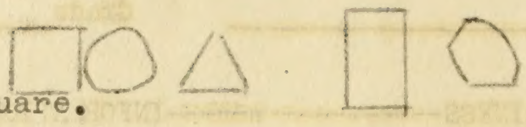
12. If you have ever bought bread for mother how much does it cost?______

13. If mother gave you a nickel for some candy and you spent a penny how much money would the storeman give you?__________

14. If you had 5¢ and spent 3¢ how much money would you have left?______

FIGURES

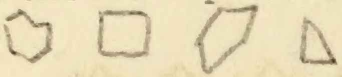
15. Betty was playing a game with Nan. It was just like this one. Can you play it?



16. Put a dot in the square.

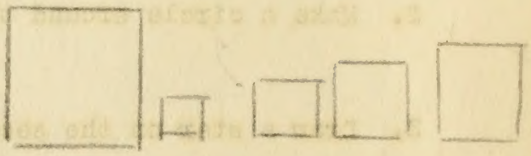
17. Draw a line through the circle.

18. Mark the prettiest square.



19. See these blocks?

Draw a star in the biggest block.



20. Make a cross in the middle block.

21. Draw a circle around the littlest block.

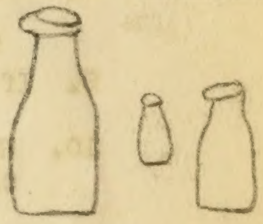
INFORMATION

22. How many days in a week? ______

23. How many fingers have you? ______

24. What size shoe do you wear? ______

25. Have you seen the little paper boxes in which eggs are bought at the store, each in a separate little room? How many rooms in a box? ______



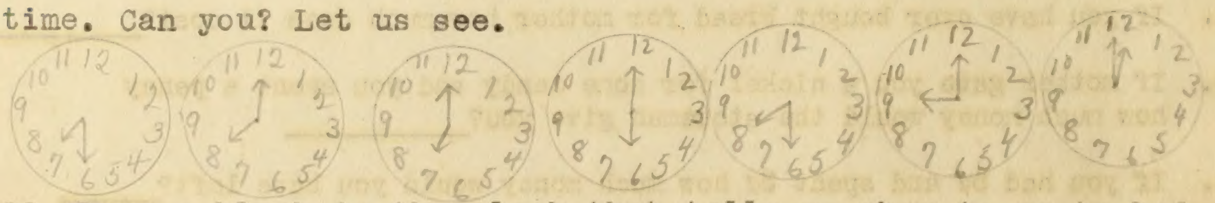
26. Make believe these are bottles of milk.

Cross out the bottle that store milk comes in.

27. Put a circle around the bottle that school milk comes in.

TIME

Betty has a Micky Mouse watch. Have you? She has learned to tell time. Can you? Let us see.



28. Draw a block in the clock that tells us when to go to bed.

29. Make a star in the clock that tells us when to get up.

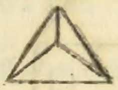
30. Put a circle around the clock that tells us what time it is when the whistle blows at noon.

31. Make a line through the clock that tells you when to start for school in the morning.

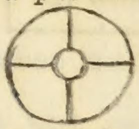
PART II

MISCELLANEOUS

32. Make a picture like this one.



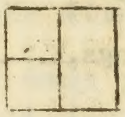
33. Draw a picture just like this one.



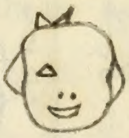
34. Make a circle

35. Draw a square.

36. Put in the missing part.



37. What part of her face is gone? Put it in.



38. Write these numbers. five zero eight two. ____ ____ ____ ____

39. Write these numbers. six four three nine. ____ ____ ____ ____

NUMBER RECOGNITION

40. Cross out number six.
3 5 6 9 8 3

41. What number comes after thirty four? ________

42. Put a circle around fifteen.
3 17 9 18 51 6 15

43. Can you write the number that comes after nineteen? ________

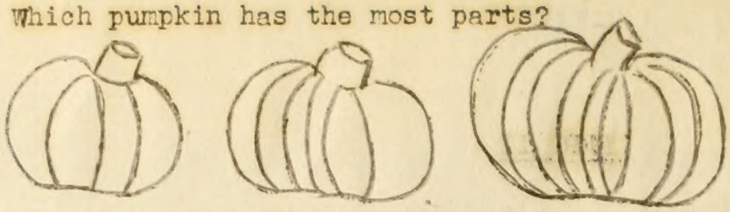
44. Do you know what comes before nine? Write it. ________

45. See if you can write three hundred twelve. ________

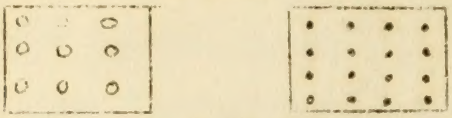
46. This is easier. Write eighty nine. ________

DIRECTIONS

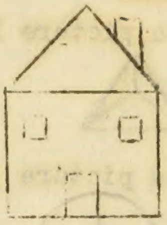
47. Which pumpkin has the most parts?



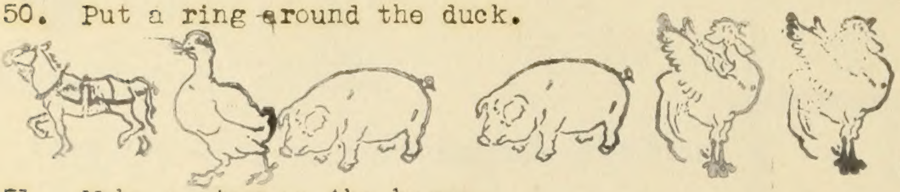
48. See if I can fool you. Which box has more dots in it?



49. Cut the house in half with a pencil line.



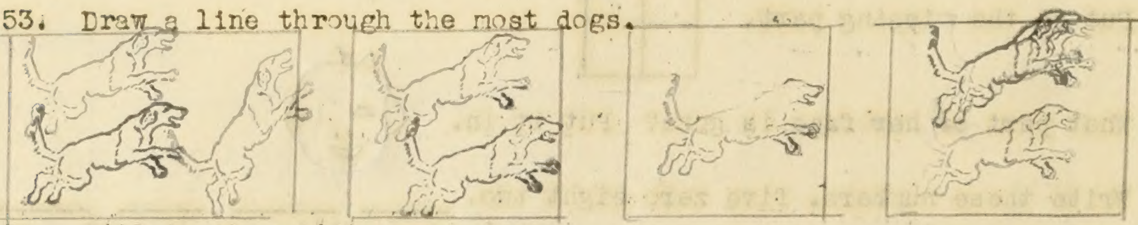
50. Put a ring around the duck.



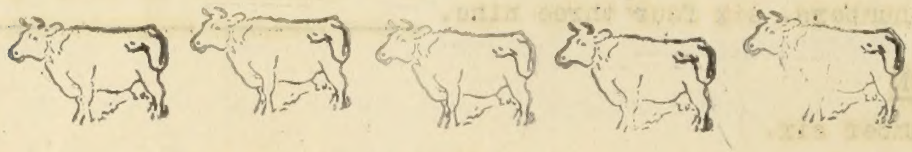
51. Make a star on the horse.

52. Draw a block around the two pigs.

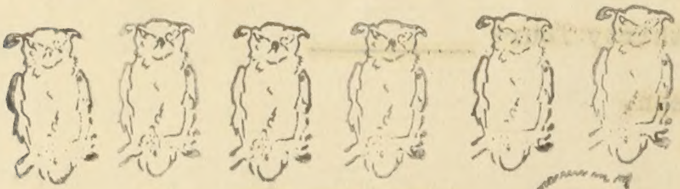
53. Draw a line through the most dogs.



54. Fill in the middle cow.

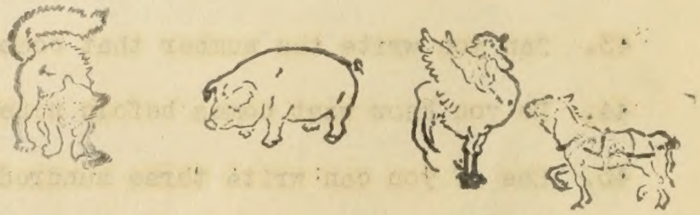


55. Cross out half the owls.



56. Make a line over the pig.

57. Make a line under the rooster.



NUMBER KNOWLEDGE

58. Do you know these number stories?
6 5 1 4 2
3 2 1 5 3

59. 6 5 9 4 6
-4 -1 -4 -2 -3

60. 6 and 4 are ____ 2 and 5 are ________ 12 take away 6 are___
8 take away 4 are _____

The counting group does not go above twelve, this section is simple enough to permit including even the kindergarten child. This group also includes the recognition of sixth and second, as meaning six and two. There is also an item on counting by two's to thirty. This does not necessarily involve formal drill; the skill may result from a parent's interest and the play spirit. The limit was thirty in order to make success easier.

The money questions also have a considerable range. Most children know how many pennies there are in a nickel but when dimes in a dollar comes up, that will probably be beyond experience. This group also includes milk money, Red Cross money, and cost of an ice cream cone. There are two similar questions, one using a nickel and one the five cents to see if the child knows them both for the same thing.

The next group is recognizing the square, circle, littlest block, middle block and biggest block.

The next unit is entirely informational. What the children have learned here has most likely been obtained from observation. The questions include, how many fingers have you, how many days in a week, what size shoe do you wear, etc. The answers to the questions come from daily living.

The group on time includes, what time you go to bed and get up. The children get the answer to this question in school from their health lessons. There are items on the time you go to school and what time do the whistles blow at noon.

The miscellaneous group is included as a further check on the children's growth. (This group should be a check on the children.) The children unable to do this group of questions would naturally be unable to do most of the other work.

Although this is not a mental test, this group is included as a check on the mentality of the child because it is thought that any child with a mental age of four to nine should be able to do this group. There is a correlation between ability to deal with numbers and general intelligence.[1]

Number recognition is a very simple group. It starts by just recognizing numbers and next writing them. It includes the difficulty of 15, 51, etc., because many children have trouble in putting a two digit number down in the right order. It checks on counting and then, hardest of all, the writing of a three place number.

---

1. Mc Laughlin, Katherine Number Abilities of Pre-School Children Childhood Ed. May 1935 Vol XI No. 8 p. 348-353

The group on time includes, what time you go to bed and get up. The children get the answer to this question in school from their health lessons. There are items on the time you go to school and what time do the whistles blow at noon.

The miscellaneous group is included as a further check on the children's growth. (This group should be a check on the children.) The children unable to do this group of questions would naturally be unable to do most of the other work.

Although this is not a mental test, this group is included as a check on the mentality of the child because it is thought that any child with a mental age of four to nine should be able to do this group. There is a correlation between ability to deal with numbers and general intelligence.

Number recognition is a very simple group. It starts by just recognizing numbers and next writing them. It includes the difficulty of 15, 51, etc., because many children have trouble in putting a two digit number down in the right order. It checks on counting and then, hardest of all, the writing of a three place number.

---

1. Mc Laughlin, Katherine Number Abilities of Pre-School Children Childhood Ed. May 1935 Vol XI No. 8 p. 348-353

The next group is following directions. It calls for the knowledge of such words as under, over, middle, most and around, used with the thought that the child who understands them will be further along toward arithmetic readiness.

The last group is the actual doing of numbers. It includes simple addition and subtraction in both its forms.

In this test many phases of arithmetic have been included. Besides getting the material from the children themselves the files of one of the testing laboratories of a very progressive school system were used. These tests were used as a check on the test as a whole and to find out any ideas that others had used which had not been used in the test.

PRELIMINARY USAGE. Before the test was used it was tried out on a group of fifty children of about seven years old. The questions were all asked verbally and the answers noted. Guided by this preliminary testing some questions were thrown out and new ones put in. In this way the final test was made.

DIRECTIONS FOR GIVING THE TEST. Timing. Because the test was so long it was divided in two parts, each part to take about fifteen minutes. The time was established by preliminary giving of the test. If the test took longer it

was to be permitted as this is not a speed test. The second part of the test was to be given at the same time the next day and under as like conditions as possible.

In the kindergarten the test must be given individually but in the first and second grade it could be given as a group test. The wording is purposely arranged so that primary readers could understand it and the majority of children could read it. The teacher, however, is to read all the questions aloud to the children as they go along. The teacher must be sure that the child knows where to put the answer and that he knows how to make the different signs called for, such as the circle, block, line and star.

Exhibit I shows the test as it was given. Exhibit II shows the test with the questions re-numbered for the purpose of showing the results more easily.

The following are the directions given the teachers for giving the A. R. Test.

The child must first be sure of the marks he is to use. Have him make the line, circle and block first to be sure he understands.

If he doesn't understand the question repeat it or explain it by repeating it slowly and carefully.

The teacher should read all the questions. It is not expected that the child will be able to read all the questions and some will not be able to read at all yet. They can follow along as the teacher reads and put the answers in the was to be permitted as this is not a speed test. The second part of the test was to be given at the same time the next day and under as like conditions as possible.

In the kindergarten the test must be given individually but in the first and second grade it could be given as a group test. The wording is purposely arranged so that primary readers could understand it and the majority of children could read it. The teacher, however, is to read all the questions aloud to the children as they go along. The teacher must be sure that the child knows where to put the answer and that he knows how to make the different signs called for, such as the circle, block, line and star.

Exhibit I shows the test as it was given. Exhibit II shows the test with the questions re-numbered for the purpose of showing the results more easily.

The following are the directions given the teachers for giving the A. R. Test.

The child must first be sure of the marks he is to use. Have him make the line, circle and block first to be sure he understands.

If he doesn't understand the question repeat it or explain it by repeating it slowly and carefully.

The teacher should read all the questions. It is not expected that the child will be able to read all the questions and some will not be able to read at all yet. They can follow along as the teacher reads and put the answers in the proper places. Be sure he knows where to put the answers on the little lines, when indicated. If the child is unable to find the place to put the answers he may put them in the margin at the left beside the number corresponding to that question.

To help the child keep his place refer to the number of the question or to the figures, example: "See the blocks?" or "See the ducks?"

The test is to be given in two parts, allowing fifteen minutes for each part. The second part is to be given the next day, if possible, under the same conditions. The name is to be placed in the upper right hand corner of the second paper.

If the I. Q. is known please place it beside the age of the child.

The tests are not to be corrected. It is not expected that the child will answer every question. We are interested in finding out which questions the child can answer and how he answers them.

CHAPTER III

499 Cases and The Results

The test was given to 499 children. It included a small group, 21, of kindergarten children, 218 first grade children and 260 second grade children. There were five towns in Greater Boston and a small college town of Massachusetts.

One school system was used which quite definitely had arithmetic in its primary curricula. This was used to see if there was any gain in what they knew over what the children knew that had been taught only that arithmetic that is informational and used by them in their unit work.

The questions were scored as either right, wrong or not answered. In the questions where there were many answers such as questions 57, 58, 59 and 60 (Exhibit II) they were counted right, if the majority of them were right. The questions were put in to see if the process was known not if they knew the right answer. If the majority of answers was right it showed that the child understood the process.

All answers were changed to percents for the purpose of easier comparisons.

CHOOSING THE POINT OF SIGNIFICANCE. It was very hard to establish a dividing point. Some authors would say that if half or 50% of the children showed information on a subject it was worth pursuing. Others would claim that

65% of the children should know about a subject before it is used in the classroom, and still others would use 75% as the dividing line. In order to further study this matter the three different dividing points have been analized. Graph one will show this very easily while the following pages give a finer analysis of each type.

Exhibit 2. Showing the modified and recommended form of the Arithmetic-R.-Test, rearranged after using the test on 499 kindergarten, first and second grade children and studying the results.

Name____________________School______________________

Age______________________Grade________________________

ARITHMETIC READINESS_______INFORMATIONAL INVENTORY TEST____

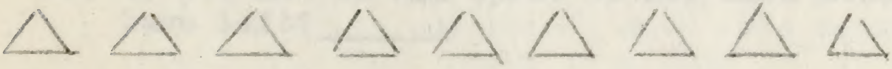
COUNTING

1. Can you count to twelve?
   Draw a line through 12 stars.

2. Make a circle around the sixth fish.

3. Draw a star on the second duck.

4. How many triangles are in the box?



5. Count by 2's to 30.

MONEY

6. How many pennies in a nickel? ________

7. How many dimes in a dollar? ____________

8. Cross out the dollar mark

¢ % " $ #

9. If you go alone for an ice cream cone how much money do you take?

10. How much milk money do you bring?
Cross out the number.
5 10 20 25 15 30

11. Cross out the Red Cross money you bring with a star.

1 6 4 10 9 8 0

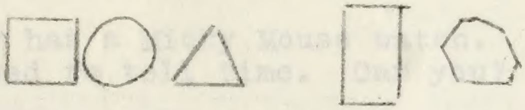
12. If you have ever bought bread for mother how much does it cost? ________

13. If mother gave you a nickel for some candy and you spent a penny how much money would the storeman give you? ______

14. If you had 5¢ and spent 3¢ how much money would you have left? ______

FIGURES

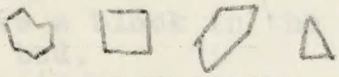
Betty was playing a game with Nan. It was just like this one. Can you play it?

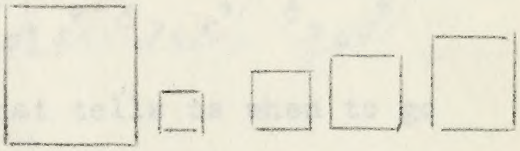


15. Put a dot in the square.

16. Draw a line through the circle.

17. Mark the prettiest square.





18. See these blocks?
Draw a star in the biggest block.

19. Make a cross in the middle block.

20. Draw a circle around the littlest block.

INFORMATION

21. How many days in a week? ____________

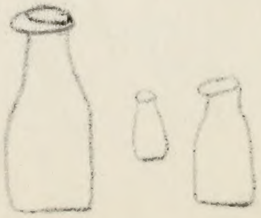
22. How many fingers have you? ____________

23. What size shoe do you wear? ____________

24. Have you seen the little paper boxes in which eggs are bought at the store, each in a separate little room? How many rooms in a box? ____________

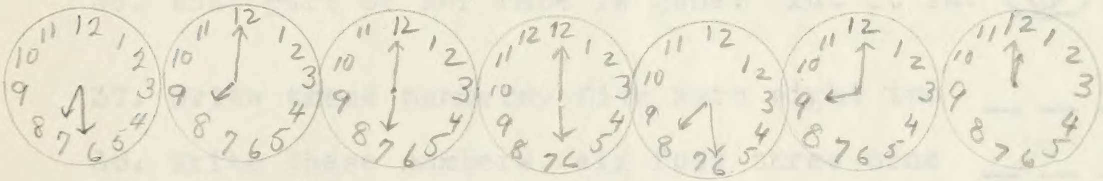
25. Make believe these are bottles of milk.
Cross out the bottle that store milk comes in.

26. Put a circle around the bottle that school milk comes in.



TIME

Betty has a Micky Mouse watch. Have you? She has learned to tell time. Can you? Let us see.



27. Draw a block in the clock that tells us when to go to bed.

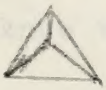
28. Make a star in the clock that tells us when to get up.

29. Put a circle around the clock that tells us what time it is when the whistles blow at noon.

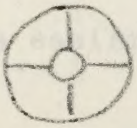
30. Make a line through the clock that tells you when to start for school in the morning.

PART II
MISCELLANEOUS

31. Make a picture like this one.



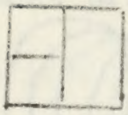
32. Draw a picture just like this one.



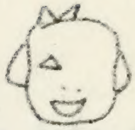
33. Make a circle.

34. Draw a square.

35. Put in a missing part.



36. What part of her face is gone? Put it in.



37. Write these numbers. five zero eight two __ __ __ __

38. Write these numbers. six four three nine __ __ __ __

NUMBER RECOGNITION

39. Cross out number six

3 5 6 9 8 3

40. What number comes after thirty four?______

41. Put a circle around fifteen.

3 17 9 18 51 6 15

42. Can you write the number that comes after nineteen?

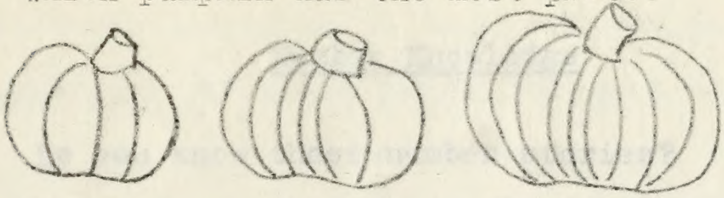
43. Do you know what comes before nine? What it. _____

44. See if you can write three hundred twelve._________

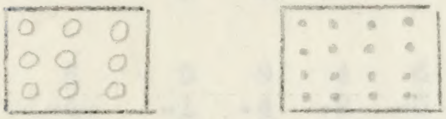
45. This is easier. Write eighty nine. ______

DIRECTIONS

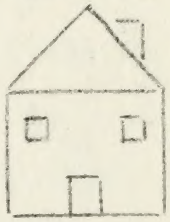
46. Which pumpkin has the most parts?



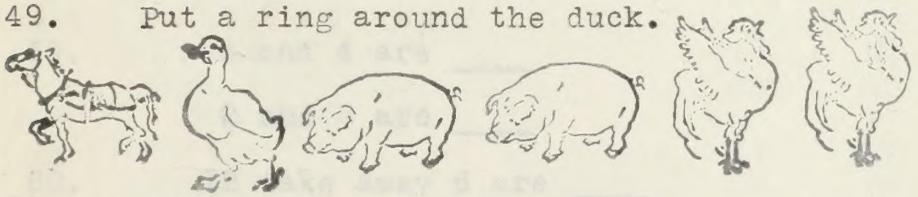
47. See if I can fool you. Which box has more dots in it?



48. Cut the house in half with a pencil line.



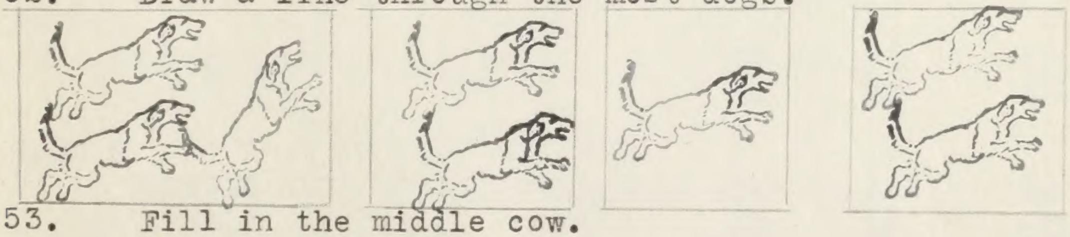
49. Put a ring around the duck.



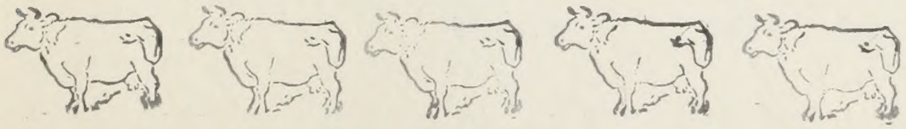
50. Make a star on the horse.

51. Draw a block around the two pigs.

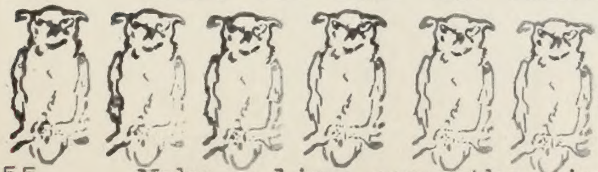
52. Draw a line through the most dogs.



53. Fill in the middle cow.

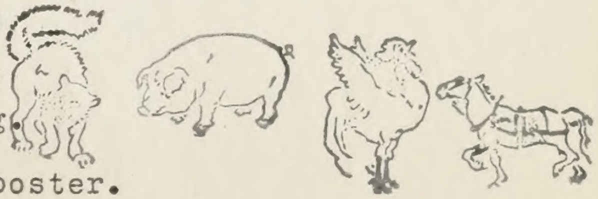


54. Cross out half the owls.



55. Make a line over the pig.

56. Make a line under the rooster.



Number Knowledge

57. Do you know these number stories?

6	5	o	4	2
3	2	1	5	3

58.

6	5	9	4	6
-4	-1	-4	-2	-3

59. 6 and 4 are ____

2 and 5 are ____

60. 12 take away 6 are ____

8 take away 4 are ____

Table I shows the number of children in the experiment. It is arranged according to town, school, grade, number of boys, number of girls and totals for each class and grade.

Number of Children

	Boys	Girls	Total
Town A	12	9	21
Town B			
Grade I	13	18	31
Grade 2	26	24	50
Town C School 1			
Grade 1	19	21	40
Grade 2	20	19	39
Town C School 2			
Grade 1	23	20	43
Grade 2	38	34	72
Town D			
Grade 1	10	8	18
Grade 2	10	13	23
Town E			
Grade 1	33	24	57
Grade 2	21	30	51
Town F			
Grade 1	14	15	29
Grade 2	12	13	25
Totals	251	248	499

Table Two gives the returns of twelve boys in the kindergarten of Town A. Town A is a small college town about fifty miles from Boston. This test was done in the training school of that town. It was given individually by the teachers in training.

There were twelve questions that no child got right. This included such questions as counting by two's, dimes in a dollar, cost of bread, example on making change, size of shoe, noon whistle, number coming after nineteen, writing two and three digit numbers and simple additional examples.

An interesting fact is that none got the thirteenth example right which required making change from a nickel while 17% were able to make the change from five cents. Also 58% never attempted the thirteenth example while only 41½% didn't attempt the fourteenth example. Exactly the same percent got it wrong 41½%. No doubt the word nickel was the disturbing factor. As far as percent right was concerned it correlated very nicely with question six where they had to tell the numbers of pennies in a nickel. Only 25% of the children knew this while only 8% didn't attempt it. Most of them attempted it but got it wrong. The percent of wrong answers was 67.

Table Two gives the returns of twelve boys in the kindergarten of Town A. Town A is a small college town about fifty miles from Boston. This test was done in the training school of that town. It was given individually by the teachers in training.

There were twelve questions that no child got right. This included such questions as counting by twos, dimes in a dollar, cost of bread, example on making change, size of shoe, noon whistle, number coming after nineteen, writing two and three digit numbers and simple additional examples.

An interesting fact is that none got the thirteenth example eight which required making change from a nickel while 17% were able to make the change from five cents. Also 58% never attempted the thirteenth example while only 41⅔% didn't attempt the fourteenth example. Exactly the same percent got it wrong 41⅔%. No doubt the word nickel was the disturbing factor. As far as percent right was concerned it correlated very nicely with question six where they had to tell the numbers of pennies in a nickel. Only 25% of the children knew this while only 8% didn't attempt it. Most of them attempted it but got it wrong. The percent of wrong answers was 67.

Table II shows the responses in terms of right, wrong and no answer on the sixty questions of the test by twelve boys in the kindergarten of Town A. See p. 22 for copy of the test.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	6	4	2	50%	33%	17%
2	6	6	-	50%	50%	-
3	6	6	-	50%	50%	-
4	8	1	3	67%	8%	25%
5	-	-	12	-	-	100%
6	3	8	1	25%	67%	8%
7	-	9	3	-	75%	25%
8	3	3	6	25%	25%	50%
9	4	7	1	34%	58%	8%
10	-	5	7	-	42%	58%
11	2	3	7	17%	28%	58%
12	-	5	7	-	42%	58%
13	-	5	7	-	42½%	58½%
14	2	5	5	17%	41½%	41½%
15	8	4	-	67%	33%	-
16	10	1	1	84%	8%	8%
17	10	2	-	83½%	16½%	-
18	12	-	-	100%	-	-
19	3	8	1	25%	67%	8%
20	11	1	-	92%	8%	-
21	2	5	5	17%	41½%	41½%
22	3	9	-	25%	75%	-
23	-	7	5	-	58%	42%
24	2	6	4	17%	50%	33%
25	11	1	-	92%	8%	-
26	5	6	1	42%	50%	8%
27	3	2	7	25%	17%	58%
28	3	2	7	25%	17%	58%
29	-	4	8	-	67%	33%
30	2	3	7	17%	25%	58%
31	2	10	-	17%	83%	-
32	7	5	-	58%	42%	-
33	9	2	1	75%	17%	8%
34	6	5	1	50%	42%	8%
35	8	2	2	67%	16½%	16½%
36	11	1	-	92%	8%	-
37	1	5	6	8%	42%	50%
38	1	4	7	8%	34%	58%
39	2	6	4	17%	50%	33%
40	2	1	9	17%	8%	75%
41	3	3	6	25%	25%	50%

Question	Number Right	Number Wrong	Number of no Answer	Percent Right	Percent Wrong	Percent of No Answer
42	-	1	11	-	8%	92%
43	2	-	10	17%	-	83%
44	-	2	10	-	17%	83%
45	-	-	12	-	-	100%
46	12	-	-	100%	-	-
47	11	1	-	92%	8%	-
48	9	3	-	75%	25%	-
49	10	-	2	83%	-	17%
50	12	-	-	100%	-	-
51	12	-	-	100%	-	-
52	9	2	1	75%	17%	8%
53	9	3	-	75%	25%	-
54	5	7	-	42%	58%	-
55	3	9	-	25%	75%	-
56	8	4	-	66%	34%	-
57	1	2	9	8%	17%	75%
58	-	2	10	0	17%	83%
59	-	-	12	-	-	100%
60	-	-	12	-	-	100%

Table Three gives the returns of the nine girls in the kindergarten of Town A. They too had twelve questions with no right answers. These included counting by two like the boys. They, unlike the boys who had 25%, did not know the pennies in the nickel but like the boys were scoreless on dimes in a dollar. They were the same on the cost of bread but did better on change for a nickel with 12% against 0 and on the change for five cents 22% against 17%. Although the percent is higher in looking at the actual figures under the column marked number right we find that in both cases exactly two children got it right.

The girls missed the question on rooms in an egg box while the boys got 17% on it. However almost half the girls knew their shoe size, 45%, while no boys did. This is probably due to the fact that girls care more about those things.

Both groups missed the number coming after nineteen and writing two and three place digits and the simple arithmetic problems with the exception of the first addition question where one boy, 8%, knew these.

Except for the size of the shoe the answers ran very nearly the same. as for the boys of Table II.

Table Three gives the returns of the nine girls in the Kindergarten of Town [illegible]. They got [illegible] twelve questions [illegible] right answers. These included counting by two like the boys. They, unlike the boys who had 25%, did not know the pennies in the nickel but like the boys were poor less on dimes in a dollar. They were [illegible] same on the cost of bread but did better on change for a nickel with 12% against 0% and on the change for fifty cents 22% against 17%. Although the percent is higher [illegible] out the actual figures under the column marked number right we find that in both cases exactly [illegible] children got it right.

The girls missed the question on [illegible] in an egg box while the boys got 17% on it. However almost [illegible] the girls knew their shoe size, 45% while no boys did. This is probably due to the fact that girls [illegible] more about those things.

Both groups missed the [illegible] counting after nineteen and writing two and three place digits and the simple arithmetic problems with the exception of the first addition question where one boy, 8% knew these.

Except for the size of the shoe the answers was very nearly the same as for the boys of table II.

Table III shows the responses in terms of right, wrong and no answer on the sixty questions of the test by nine girls in the kindergarten of Town A.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	5	4	-	55%	45%	-
2	6	3	-	67%	33%	-
3	6	3	-	67%	33%	-
4	8	1	-	89%	11%	-
5	-	-	9	-	-	100%
6	-	7	2	-	78%	22%
7	-	7	2	-	78%	22%
8	2	1	6	22%	11%	67%
9	2	5	2	22%	56%	22%
10	2	3	4	22%	33%	45%
11	1	3	5	12%	33%	55%
12	-	4	5	-	45%	55%
13	1	3	5	12%	33%	55%
14	2	4	3	22%	45%	33%
15	6	2	1	67%	23%	12%
16	8	1	-	88%	12%	-
17	8	1	-	88%	12%	-
18	9	-	-	100%	-	-
19	2	7	-	22%	78%	-
20	8	1	-	88%	12%	-
21	2	4	3	22%	45%	33%
22	3	6	-	33%	67%	-
23	4	-	5	45%	-	55%
24	-	6	3	-	67%	33%
25	9	-	-	100%	-	-
26	5	4	-	55%	45%	-
27	1	2	6	12%	22%	67%
28	1	3	5	12%	33%	55%
29	2	1	6	22%	12%	66%
30	3	1	5	33%	12%	55%
31	2	7	-	22%	78%	-
32	4	5	-	45%	55%	-
33	7	2	-	78%	22%	-
34	4	5	-	45%	55%	-
35	2	6	1	22%	67%	12%
36	6	3	-	67%	33%	-
37	2	1	6	22%	12%	67%
38	2	1	6	22%	12%	67%
39	1	6	2	12%	67%	22%
40	3	1	5	33%	12%	55%
41	3	3	3	33%	33%	33%
42	-	3	6	-	33%	67%

Table III, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
43	1	1	7	11½%	11½%	77%
44	-	1	8	-	12%	88%
45	-	1	8	-	12%	88%
46	9	-	-	100%	-	-
47	9	-	-	100%	-	-
48	7	1	1	77%	11½%	11½%
49	9	-	-	100%	-	-
50	8	1	-	88%	12%	-
51	6	3	-	67%	33%	-
52	8	-	1	88%	-	12%
53	7	2	-	78%	22%	-
54	2	7	-	22%	78%	-
55	1	8	-	12%	88%	-
56	4	5	-	45%	55%	-
57	-	2	7	- -	22%	78%
58	-	2	7	- -	22%	78%
59	-	2	7	- -	22%	78%
60	-	2	7	- -	22%	78%

Table Four shows the returns on thirteen boys in Grade one of Town B. Town B is a city of greater Boston. It has about 60,000 inhabitants. There are some factories there but the majority of wage earners commute to Boston to work. This school is situated in a section where it draws from all these sources and also from homes where the welfare does the supporting.

This particular room has been having arithmetic since September. They had all the addition facts to ten and were studying the subtraction facts when the test was given. This easily explains the high percents on the last four questions: 57 - 92%, 58 - 100%, 59 - 100%, 60 - 100%.

It will be noticed that all questions dealing with actual numbers have a very high percent, most of them 100% with a few below and only one in the sixties, that being the question 40, with the exception of question 44 which was missed entirely.

Only four questions were missed entirely. They were counting by twos, amount of milk money, size bottle school milk comes in and the time you start for school.

With the exception of knowing the dollar mark, shoe size, time for bed and writing a three digit number at least half the children knew the answers to all question.

Table IV shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 13 boys in Grade One of Town B.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	10	3	-	77%	23%	-
2	11	2	-	84%	16%	-
3	12	1	-	92%	8%	-
4	11	2	-	84%	16%	-
5	-	1	12	-	8%	92%
6	10	3	-	77%	23%	-
7	9	1	3	69%	8%	23%
8	1	1	11	8%	8%	84%
9	8	-	5	62%	-	38%
10	-	10	3	-	77%	23%
11	8	5	-	62%	38%	-
12	10	-	3	77%	-	23%
13	8	1	4	62%	30%	8%
14	9	-	4	69%	-	31%
15	12	1	-	92%	8%	-
16	12	1	-	92%	8%	-
17	7	1	5	54%	8%	38%
18	13	-	-	100%	-	-
19	12	-	1	92%	-	8%
20	13	-	-	100%	-	-
21	12	1	-	92%	8%	-
22	11	2	-	84%	16%	-
23	1	-	12	8%	-	92%
24	8	3	2	62%	22%	16%
25	13	-	-	100%	-	-
26	-	-	13	-	-	100%
27	1	1	11	8%	8%	84%
28	10	1	3	77%	8%	15%
29	12	1	-	92%	8%	-
30	-	2	11	-	16%	84%
31	10	3	-	77%	23%	-
32	10	3	-	77%	23%	-
33	12	-	1	92%	-	8%
34	12	-	1	92%	-	8%
35	11	1	1	84%	8%	8%
36	13	-	-	100%	-	-
37	13	-	-	100%	-	-
38	11	2	-	84%	16%	-
39	11	2	-	84%	16%	-
40	8	4	1	62%	30%	8%
41	11	-	2	84%	-	16%

Table IV, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
42	10	2	1	77%	15%	8%
43	11	2	-	84%	16%	-
44	-	-	13	-	-	100%
45	13	-	-	100%	-	-
46	13	-	-	100%	-	-
47	13	-	-	100%	-	-
48	13	-	-	100%	-	-
49	13	-	-	100%	-	-
50	13	-	-	100%	-	-
51	12	-	1	92%	-	8%
52	13	-	-	100%	-	-
53	13	-	-	100%	-	-
54	13	-	-	100%	-	-
55	13	-	-	100%	-	-
56	13	-	-	100%	-	-
57	12	1	-	92%	8%	-
58	13	-	-	100%	-	-
59	13	-	-	100%	-	-
60	13	-	-	100%	-	-

Table Five shows the returns on the 18 girls of Grade one in Town B. The girls in this school did not do as well as the boys. They had six questions with no correct answers. Of course they were both unable to count by two's. None of them knew the dollar sign as against 8% of the boys. This is not worth comparing because it is the difference of only one child. The same is true of the question on milk money (10) where the girls had the higher percent of 6. In question 23 and 27, on the shoe size and bedtime, the same is true as in question 8. Question 26 both groups got wrong. This question concerns the school milk bottle.

The girls showed up almost as well as the boys in all number questions. The difference in percent was so slight that it isn't significant.

It will be found that the percents for the girls run a little lower than the boys but they are still particularly high.

Table Five shows the returns on the 18 girls of Grade one in Town 3. The girls in this school did not do as well as the boys. They had six questions with no correct answers. Of course they were both unable to count by twos. None of them knew the dollar sign as against 8% of the boys. This is not worth comparing because it is the difference of only one child. The same is true of the question on milk money (10) where the girls had the higher percent of 6. In question 23 and 27, on the shoe size and bedtime, the same is true as in question 8. Question 22 both groups got wrong. This question concerns the school milk bottle.

The girls showed up almost as well as the boys in all number questions. The difference in percent was so slight that it isn't significant.

It will be found that the percents for the girls run a little lower than the boys but they are still particularly high.

Table V shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 18 girls in Grade One of Town B.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	15	3	-	83%	17%	-
2	15	1	2	83%	6%	11%
3	13	4	1	72%	22%	6%
4	16	2	-	89%	11%	-
5	-	1	17	-	6%	94%
6	12	1	5	67%	6%	27%
7	12	-	6	67%	-	33%
8	-	2	16	-	11%	89%
9	11	2	5	61%	11%	27%
10	1	16	1	6%	88%	6%
11	1	1	17	6%	6%	88%
12	10	2	6	56%	11%	33%
13	12	1	5	67%	6%	27%
14	8	4	6	44%	23%	33%
15	17	1	-	94%	6%	-
16	17	-	1	94%	-	6%
17	14	-	4	77%	-	23%
18	18	-	-	100%	-	-
19	17	1	-	94%	6%	-
20	18	-	-	100%	-	-
21	16	-	2	89%	-	11%
22	13	2	3	72%	11%	17%
23	-	2	15	-	11%	89%
24	12	4	2	67%	22%	11%
25	16	-	2	89%	-	11%
26	-	-	18	-	-	100%
27	-	-	18	-	-	100%
28	15	-	3	83%	-	17%
29	17	-	1	94%	-	6%
30	5	-	13	27%	-	73%
31	11	7	-	61%	39%	-
32	16	2	-	89%	11%	-
33	17	1	-	94%	6%	-
34	16	1	1	89%	5½%	5½%
35	16	1	1	89%	5½%	5½%
36	18	-	-	100%	-	-
37	18	-	-	100%	-	-
38	18	-	-	100%	-	-
39	16	1	1	89%	5½%	5½%
40	16	1	1	89%	5½%	5½%

Table V, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	16	1	1	89%	5½%	5½%
42	15	3	-	83%	17%	-
43	15	1	2	83%	6%	11%
44	-	1	17	-	6%	94%
45	15	1	2	83%	6%	11%
46	18	-	-	100%	-	-
47	18	-	-	100%	-	-
48	17	1	-	94%	6%	-
49	18	-	-	100%	-	-
50	18	-	-	100%	-	-
51	18	-	-	100%	-	-
52	18	-	-	100%	-	-
53	16	2	-	89%	11%	-
54	16	-	2	89%	-	11%
55	17	-	1	94%	-	6%
56	17	-	1	94%	-	6%
57	18	-	-	100%	-	-
58	18	-	-	100%	-	-
59	18	-	-	100%	-	-
60	18	-	-	100%	-	-

Table Six shows the returns of 19 boys in Town C, School 1. Town C is a city like Town B. It is about the same size and is adjoining Town B. The schools in this system have no formal arithmetic in the first grade. This difference will show up more clearly in a later chart which gives each class as a whole.

Counting by two's, rooms in an egg box, and writing three digits still draws a blank in the column for percent right. The simple addition is very low while the subtraction is entirely unknown.

The percent of right answers seems to run much lower for this group than for the boys of Town B, probably due to contacts in the school.

Table VI shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 19 boys in Grade One of Town C, School 1.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	11	7	1	58%	37%	5%
2	18	1	-	95%	5%	-
3	17	2	-	90%	10%	-
4	16	3	-	84%	16%	-
5	-	-	19	-	-	100%
6	15	1	3	79%	16%	5%
7	3	-	16	16%	-	84%
8	9	5	5	48%	26%	26%
9	14	-	5	74%	-	26%
10	7	6	6	37%	31½%	31½%
11	1	1	17	5%	5%	90%
12	2	1	16	11%	5%	84%
13	7	-	12	37%	-	63%
14	8	2	9	42%	11%	47%
15	14	3	2	74%	10½%	15½%
16	19	-	-	100%	-	-
17	18	1	-	95%	5%	-
18	18	1	-	95%	5%	-
19	14	5	-	74%	26%	-
20	17	2	-	90%	10%	-
21	4	2	13	21%	10%	69%
22	6	9	4	31%	48%	21%
23	3	1	15	16%	5%	79%
24	-	-	19	-	-	100%
25	16	3	-	84%	16%	-
26	6	13	-	32%	68%	-
27	7	4	8	37%	21%	42%
28	7	5	7	37%	26%	37%
29	5	7	7	26%	37%	37%
30	3	11	5	16%	58%	26%
31	12	7	-	63%	37%	-
32	15	4	-	79%	21%	-
33	18	1	-	95%	5%	-
34	19	-	-	100%	-	-
35	14	5	-	74%	26%	-
36	18	1	-	95%	5%	-
37	16	3	-	84%	16%	-
38	13	5	1	68%	27%	5%
39	16	-	3	84%	-	16%
40	7	3	9	37%	16%	47%

Table VI, cont.

Question	Number Right	Number Wrong	Nunber Of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	7	10	2	37%	53%	10%
42	9	1	9	48%	5%	48%
43	14	2	3	74%	10%	16%
44	-	2	17	-	10%	90%
45	9	1	9	48%	5%	48%
46	19	-	-	100%	-	-
47	18	-	1	95%	-	5%
48	17	2	-	90%	10%	-
49	19	-	-	100%	-	-
50	19	-	-	100%	-	-
51	18	-	1	95%	-	5%
52	18	1	-	95%	5%	-
53	16	3	-	84%	16%	-
54	11	8	-	58%	42%	-
55	16	2	1	84%	11%	5%
56	16	2	1	84%	11%	5%
57	3	1	15	16%	5%	79%
58	-	-	19	-	-	100%
59	5	-	14	26%	-	74%
60	-	-	19	-	-	100%

Table Seven shows the returns of 21 girls in Town C, school 1.

In comparing this group with the boys, the tenth question is interesting. The question asks the amount of milk money brought. The girls did not know the answer while 37% of the boys knew it. About 37½% of the boys got it wrong as against 5% of the girls. There was 31½% of no answers by the boys as against 95% of the girls.

The percents on question 11, 12 and 22 which concern Red Cross money, cost of bread and number of fingers have similiar differences in percents. In each instance the percent of right answers is higher for the girls.

All other questions are quite similiar to the answers of the boys of this school. The differences are not significant.

Table VII shows the responses in terms of right, wrong and no answers on the sixty questions of the test by 21 girls in Grade One of Town C, School 1.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	10	11	-	48%	52%	-
2	17	4	-	81%	19%	-
3	20	-	1	95%	-	5%
4	-	-	21	-	-	100%
5	16	2	3	76%	10%	14%
6	1	2	18	5%	10%	85%
7	11	3	7	52%	17%	34%
8	17	-	4	81%	-	19%
9	9	2	10	43%	9%	48%
10	-	1	20	-	5%	95%
11	6	-	15	28%	-	72%
12	7	1	13	33%	5%	62%
13	9	1	11	43%	5%	52%
14	18	2	1	86%	9%	5%
15	19	1	1	90%	5%	5%
16	21	-	-	100%	-	-
17	20	1	-	95%	5%	-
18	20	-	1	95%	-	5%
19	12	7	2	57%	33%	9%
20	19	2	-	90%	10%	-
21	4	1	16	19%	5%	76%
22	12	9	-	57%	43%	-
23	5	3	13	24%	14%	62%
24	-	1	20	-	5%	95%
25	20	1	-	95%	5%	-
26	11	7	3	52%	34%	14%
27	8	6	7	38%	28%	34%
28	6	10	5	28%	48%	24%
29	8	7	6	38%	34%	28%
30	4	9	8	19%	43%	38%
31	15	6	-	72%	28%	-
32	20	1	-	95%	5%	-
33	20	-	1	95%	-	5%
34	19	1	1	90%	5%	5%
35	17	4	-	81%	19%	-
36	19	2	-	90%	10%	-
37	16	5	-	76%	24%	-
38	18	3	-	86%	14%	-
39	20	-	1	95%	-	5%
40	6	3	12	28%	14%	58%

Table VII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	6	10	5	28%	48%	24%
42	4	1	16	19%	5%	76%
43	16	1	4	76%	5%	19%
44	-	2	19	-	10%	90%
45	7	2	12	33%	10%	57%
46	20	1	-	95%	5%	-
47	21	-	-	100%	-	-
48	18	3	-	86%	14%	-
49	21	-	-	100%	-	-
50	20	-	1	95%	-	5%
51	21	-	-	100%	-	-
52	21	-	-	100%	-	-
53	19	2	-	90%	10%	-
54	12	7	2	57%	33%	10%
55	15	4	2	71%	19%	10%
56	19	1	1	90%	5%	5%
57	2	2	17	10%	10%	80%
58	-	1	20	-	5%	95%
59	13	1	7	62%	5%	33%
60	-	1	20	-	5%	95%

Tables Eight and Nine show the returns of 23 boys and 20 girls of Town C, School 2.

This school is much larger than School 1 but the conditions are similar.

In comparing the answers of the two groups the majority of percentages were similar. There are eleven exceptions to this.

In looking at question eight on the dollar sign the boys did considerably better with 70% right answers while the girls only had 35% right answers. The percent of wrong answers for both was in the twenties while the boys had 4% of no answers and the girls 45%.

The twelvth question on the cost of bread was similar. Boys had 57% right, 30% no answer and the girls had 30% right, 60% no answer and both groups had about 10% of wrong answers.

The boys did about 20% better on question fourteen on getting change for five cents with 91% of right answers against 70% for the girls.

The girls did better on question twenty-two on knowing your fingers, 30% getting it right while only 13% of the boys got it right.

The girls couldn't do the twenty-fourth question, on the number of rooms in an egg box while 22% of the boys got it right.

Tables Eight and Nine show the returns of 23 boys and 20 girls of Town C, School 2.

This school is much larger than School 1 but the conditions are similar.

In comparing the answers of the two groups the majority of percentages were similar. There are eleven exceptions to this.

In looking at question eight on the dollar sign the boys did considerably better with 70% right answers while the girls only had 35% right answers. The percent of wrong answers for both was in the twenties while the boys had 4% of no answers and the girls 45%.

The twelvth question on the cost of bread was similar. Boys had 57% right, 30% no answer and the girls had 30% right, 60% no answer and both groups had about 10% of wrong answers.

The boys did about 20% better on question fourteen on getting change for five cents with 91% of right answers against 70% for the girls.

The girls did better on question twenty-two on knowing your fingers, 30% getting it right while only 13% of the boys got it right.

The girls couldn't do the twenty-fourth question, on the number of rooms in an egg box while 22% of the boys got it right.

On the questions on time the boys did better. Their percents of right answers ran in the fifties while the girls went between 20% and 35%.

On question thirty-five, putting in a missing part, the boys did it 100% while only 65% of the girls got it right.

On question forty-one, recognizing 15, 70% of the girls knew it while only 48% of the boys knew it.

Question fifty-nine on simple addition was poorly done by both groups. Only one boy, 4%, got it right while 20% (4) of the girls got it right.

Table VIII shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 23 boys in Grade One, Town C, School 2.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	19	4	-	83%	17%	-
2	20	3	-	87%	13%	-
3	23	-	-	100%	-	-
4	22	1	-	96%	4%	-
5	-	-	23	-	-	100%
6	15	1	7	65%	5%	30%
7	2	7	14	9%	30%	61%
8	16	6	1	70%	26%	4%
9	20	3	-	87%	13%	-
10	16	7	-	70%	30%	-
11	1	-	22	4%	-	96%
12	13	3	7	57%	13%	30%
13	15	-	8	65%	-	35%
14	21	1	1	91%	4½%	4½%
15	22	1	-	95%	4%	-
16	23	-	-	100%	-	-
17	23	-	-	100%	-	-
18	23	-	-	100%	-	-
19	17	6	-	74%	26%	-
20	23	-	-	100%	-	-
21	7	8	8	30%	35%	35%
22	3	20	-	13%	87%	-
23	11	4	8	48%	17%	35%
24	5	3	15	22%	13%	65%
25	22	1	-	96%	4%	-
26	8	15	-	35%	65%	-
27	12	6	5	52%	26%	22%
28	13	4	6	57%	17%	26%
29	11	8	4	48%	35%	17%
30	11	7	5	48%	30%	22%
31	22	1	-	96%	4%	-
32	19	4	-	83%	17%	-
33	22	1	-	96%	4%	-
34	20	3	-	87%	13%	-
35	23	-	-	100%	-	-
36	23	-	-	100%	-	-
37	21	2	-	91%	9%	-
38	21	2	-	91%	9%	-
39	23	-	-	100%	-	-
40	13	2	8	57%	9%	34%

Table VIII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	11	11	1	48%	48%	4%
42	15	-	8	65%	-	35%
43	17	3	3	74%	14%	13%
44	2	4	17	9%	15%	74%
45	18	1	4	79%	4%	17%
46	22	1	-	96%	4%	-
47	23	-	-	100%	-	-
48	21	2	-	91%	9%	-
49	23	-	-	100%	-	-
50	23	-	-	100%	-	-
51	23	-	-	100%	-	-
52	23	-	-	100%	-	-
53	22	1	-	96%	4%	-
54	11	11	1	48%	48%	4%
55	15	8	-	65%	35%	-
56	21	2	-	91%	9%	-
57	7	-	16	30%	-	70%
58	-	7	16	-	30%	70%
59	1	-	22	4%	-	96%
60	1	-	22	4%	-	96%

Boston University
School of Education
Library

Table IX shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 20 girls in Grade One, Town C, School 2

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	15	5	-	75%	25%	-
2	18	2	-	90%	10%	-
3	18	2	-	90%	10%	-
4	17	-	3	85%	-	15%
5	-	-	20	-	-	100%
6	11	-	9	55%	-	45%
7	-	-	20	-	-	100%
8	7	4	9	35%	20%	45%
9	18	1	1	90%	5%	5%
10	14	3	3	70%	15%	15%
11	1	-	19	5%	-	95%
12	6	2	12	30%	10%	60%
13	10	1	9	50%	5%	45%
14	14	3	3	70%	15%	15%
15	18	1	1	90%	5%	5%
16	19	1	-	95%	5%	-
17	18	2	-	90%	10%	-
18	18	-	-	90%	-	10%
19	17	1	2	85%	5%	10%
20	18	-	2	90%	-	10%
21	6	3	11	30%	15%	55%
22	7	12	1	35%	60%	5%
23	7	1	12	35%	5%	60%
24	-	-	-	-	-	100%
25	18	1	1	90%	5%	5%
26	10	9	1	50%	45%	5%
27	5	3	12	25%	15%	60%
28	7	1	12	35%	5%	60%
29	4	12	4	20%	60%	20%
30	8	4	8	40%	20%	40%
31	16	3	1	80%	15%	5%
32	16	4	-	80%	20%	-
33	20	-	-	100%	-	-
34	17	2	1	85%	10%	5%
35	13	2	5	65%	10%	25%
36	19	-	1	95%	-	5%
37	19	-	1	95%	-	5%
38	19	1	-	95%	5%	-
39	19	-	5	95%	-	5%
40	10	2	8	50%	10%	40%

Table IX, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	14	5	1	70%	25%	5%
42	10	1	9	50%	5%	45%
43	16	1	3	80%	5%	15%
44	-	2	18	-	10%	90%
45	13	1	6	65%	5%	30%
46	20	-	-	100%	-	-
47	20	-	-	100%	-	-
48	20	-	-	100%	-	-
49	20	-	-	100%	-	-
50	20	-	-	100%	-	-
51	20	-	-	100%	-	-
52	20	-	-	100%	-	-
53	19	1	-	95%	5%	-
54	12	6	2	60%	30%	10%
55	10	9	1	50%	45%	5%
56	18	2	-	90%	10%	-
57	3	1	16	15%	5%	80%
58	-	1	19	-	5%	95%
59	4	-	16	20%	-	80%
60	-	-	20	-	-	100%

Tables Ten and Eleven show the returns of 10 boys and 8 girls in Grade One in Town D.

Town D is a small farming district near Boston, The children all come from quite some distance in the school buses. The better class families tend to send their children to private school.

There seems to be more of a comparison between the boys and girls of this town than of Town C. There are twelve questions whose returns show very marked difference. Questions 24, 29 and 41 are found noteworthy of comparison in Town C, School 2 and also here with the other nine entirely new questions.

Question one, counting twelve stars, is the first difference we find. The girls knew it 100% while only 70% of the boys knew the answer. In such a simple question as this it seems peculiar that there should be such a marked difference.

We found in Town C, School 1, a difference on question 10, amount of milk money. The difference here is that the girls did better with 88% getting it right while only 50% of the boys got it right. In Town C, School 1, the percentage of right answers was in favor of the boys.

The boys did better on marking the prettiest square, question 17, with 90% right while the girls only got 63% right.

As in Town C, School 2, the girls showed up better on question 22, number of fingers, with a score of 75% as against 40% for the boys. The difference in range here being 35% and in the other 27%. Strange to say the girls' higher score there was only 30% which is not equal to the lower boys score here of 40%.

Unlike the other school, the girls did better on knowing the rooms in an egg basket (24) with 63% against the boys' score of 30%. Not one girl in the other school could do it and only 22% of the boys. Again the same school is lower in both cases.

The boys recognized the school milk bottles better than the girls with a score of 80% while the girls only got 37%.

In the first two time question (27, 28) the boys and girls were parallel but in the last two (29, 30) the girls dropped considerably, getting 25% on them both while the boys stayed constant to 70% and 50%.

Again on question 41, recognizing 15, the boys did better with 60%. The girls only got 37%. This is like the comparison of that question in Town C, School 2. The girls retaliated in writing 89 (question 45) with 75% getting it right. Only 40% of the boys got it right.

The boys did better in recognizing the word over (55) with 90%, the girls only getting 63%.

As in Town C, School 2, the girls showed up better on question 22, number of fingers, with a score of 73% as against 40% for the boys. The difference in range here being 33% and in the other 27%. Strange to say the girls' higher score there was only 50% which is not equal to the lower boys score here of 40%.

Unlike the other school, the girls did better on knowing the rooms in an egg basket (24) with 53% against the boys' score of 30%. Not one girl in the other school could do it and only 22% of the boys. Again the same school is lower in both cases.

The boys recognized the school milk bottles better than the girls with a score of 80% while the girls only got 37%.

In the first two time question (27, 28) the boys and girls were parallel but in the last two (29, 30) the girls dropped considerably, getting 25% on them both while the boys stayed constant to 70% and 50%.

Again on question 41, recognizing 15, the boys did better with 60%. The girls only got 37%. This is like the comparison of that question in Town C, School 2. The girls retaliated in writing 39 (question 45) with 75% getting it right. Only 40% of the boys got it right.

The boys did better in recognizing the word over (55) with 90%, the girls only getting 63%.

In the simple arithmetic there were no comparisons except in question 57 on simple addition, where only one boy got it right. 10% and 63% of the girls got it right.

In the simple arithmetic there were no comparisons except in question 37 on simple addition, where only one boy got it right. 10% and 63% of the girls got it right.

Table X shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 10 boys in Grade One of Town D.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	7	3	-	70%	30%	-
2	10	-	-	100%	-	-
3	8	2	-	80%	20%	-
4	9	1	-	90%	10%	-
5	-	-	10	-	-	100%
6	9	-	1	90%	-	10%
7	-	2	8	-	20%	80%
8	4	-	6	40%	-	60%
9	8	-	2	80%	-	20%
10	5	1	4	50%	10%	40%
11	2	-	8	20%	-	80%
12	-	3	7	-	30%	70%
13	8	1	1	80%	10%	10%
14	6	1	3	60%	10%	30%
15	6	2	2	60%	20%	20%
16	10	-	-	100%	-	-
17	9	1	-	90%	10%	-
18	10	-	-	100%	-	-
19	9	1	-	90%	10%	-
20	9	1	-	90%	10%	-
21	8	2	-	80%	20%	-
22	4	5	1	40%	50%	10%
23	2	-	8	20%	-	80%
24	3	4	3	30%	40%	30%
25	9	-	1	90%	-	10%
26	8	2	-	80%	20%	-
27	8	-	2	80%	-	20%
28	5	1	4	50%	10%	40%
29	7	2	1	70%	20%	10%
30	5	3	2	50%	30%	20%
31	9	-	1	90%	-	10%
32	10	-	-	100%	-	-
33	10	-	-	100%	-	-
34	10	-	-	100%	-	-
35	10	-	-	100%	-	-
36	10	-	-	100%	-	-
37	8	2	-	80%	20%	-
38	8	2	-	80%	20%	-
39	9	-	1	90%	-	10%
40	6	4	-	60%	40%	-

Table X, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	6	2	2	60%	20%	20%
42	5	4	1	50%	40%	10%
43	5	2	3	50%	20%	30%
44	-	-	10	-	-	100%
45	4	-	6	40%	-	60%
46	7	3	-	70%	30%	-
47	10	-	-	100%	-	-
48	9	1	-	90%	10%	-
49	10	-	-	100%	-	-
50	10	-	-	100%	-	-
51	10	-	-	100%	-	-
52	10	-	-	100%	-	-
53	10	-	-	100%	-	-
54	7	3	-	70%	30%	-
55	9	1	-	90%	10%	-
56	10	-	-	100%	-	-
57	1	5	4	10%	50%	40%
58	1	3	6	10%	30%	60%
59	-	-	10	-	-	100%
60	-	-	10	-	-	100%

Table XI shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 8 girls in Grade One of Town D.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	8	-	-	100%	-	-
2	8	-	-	100%	-	-
3	7	1	-	88%	12%	-
4	8	-	-	100%	-	-
5	-	-	8	-	-	100%
6	8	-	-	100%	-	-
7	-	6	2	-	75%	25%
8	2	2	4	25%	25%	50%
9	7	-	1	88%	-	12%
10	7	1	-	88%	12%	-
11	3	3	2	38%	38%	25%
12	-	6	2	-	75%	25%
13	6	-	2	75%	-	25%
14	5	1	2	63%	12%	25%
15	7	-	1	88%	-	12%
16	7	1	-	88%	12%	-
17	5	1	2	63%	12%	25%
18	8	-	-	100%	-	-
19	7	1	-	88%	12%	-
20	8	-	-	100%	-	-
21	8	-	-	100%	-	-
22	6	2	-	75%	25%	-
23	2	-	6	25%	-	75%
24	5	3	-	63%	37%	-
25	6	2	-	75%	25%	-
26	3	5	-	37%	63%	-
27	6	2	-	75%	25%	-
28	6	2	-	75%	25%	-
29	2	6	-	25%	75%	-
30	2	6	-	25%	75%	-
31	7	1	-	88%	12%	-
32	8	-	-	100%	-	-
33	8	-	-	100%	-	-
34	7	1	-	88%	12%	-
35	8	-	-	100%	-	-
36	8	-	-	100%	-	-
37	8	-	-	100%	-	-
38	8	-	-	100%	-	-
39	7	1	-	88%	12%	-
40	7	1	-	88%	12%	-

Table XI, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	3	3	2	37½%	37½%	25%
42	6	2	-	75%	25%	-
43	5	1	2	63%	12%	25%
44	-	3	5	-	37%	63%
45	6	2	-	75%	25%	-
46	6	2	-	75%	25%	-
47	8	-	-	100%	-	-
48	7	1	-	88%	12%	-
49	8	-	-	100%	-	-
50	8	-	-	100%	-	-
51	8	-	-	100%	-	-
52	8	-	-	100%	-	-
53	8	-	-	100%	-	-
54	6	2	-	75%	25%	-
55	5	3	-	63%	37%	-
56	8	-	-	100%	-	-
57	5	3	-	63%	37%	-
58	2	1	5	25%	12%	63%
59	-	-	8	-	-	100%
60	-	-	8	-	-	100%

Tables Twelve and Thirteen show the returns of 33 boys and 24 girls of Grade One in Town E.

This town is made up of Boston's Market Gardens. All the children come from farming homes. They come in the school bus and stay all day. They are a poorer class of people.

In comparing the boys and girls of the school the sameness is surprising. The percentage of right answers is so nearly parallel as not to be worth looking into. This is the first town with so few marked differences. There are only four.

As in the other farming district, question one (counting to twelve) showed the girls doing better with 75% over the boys' 58%.

Again there is a difference in knowing the school room milk bottle (26). Here, too, the boys did better with 73% against the girls' 25%. The other schools' percents however, were about ten points higher.

The time for starting for school again draws a comparison. Only 12% of the boys knew it while no girls knew it. This question seems to draw a comparison every time.

In this farming town, too, the boys knew better the meaning of the word over, getting 63% while the girls only got 46%.

Table XII shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 33 boys in Grade One of Town E.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	19	13	1	58%	39%	3%
2	24	9	-	73%	27%	-
3	25	8	-	76%	24%	-
4	23	9	1	70%	27%	30%
5	-	-	33	-	-	100%
6	17	11	5	52%	33%	15%
7	3	15	15	9%	45½%	45½%
8	7	10	16	21%	31%	48%
9	4	7	22	12%	21%	67%
10	-	12	21	-	36%	64%
11	4	1	28	12%	3%	85%
12	3	3	27	9%	9%	82%
13	5	3	25	15%	9%	76%
14	5	9	19	15%	27%	58%
15	30	3	-	91%	9%	-
16	29	3	1	88%	9%	3%
17	27	4	2	82%	12%	6%
18	33	-	-	100%	-	-
19	9	9	15	27%	27%	46%
20	30	1	2	91%	3%	6%
21	3	20	10	9%	61%	30%
22	16	9	8	49%	27%	24%
23	4	14	15	11%	43%	46%
24	2	15	16	6%	46%	48%
25	20	5	8	61%	15%	24%
26	24	7	2	73%	21%	6%
27	7	4	22	21%	11%	67%
28	7	5	21	21%	15%	64%
29	3	8	22	10%	24%	67%
30	4	5	24	12%	15%	73%
31	18	13	2	56%	38%	6%
# 32	20	11	1	62%	34%	4%
33	26	2	4	81%	6%	13%
34	25	2	5	78%	6%	16%
35	25	5	2	78%	16%	6%
36	26	6	-	81%	19%	-
37	19	9	4	59%	28%	13%
38	16	11	5	50%	34%	16%
39	25	3	4	78%	9%	13%
40	3	13	16	9%	41%	50%

# Second section has only a total of 32 children.

Table XII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	13	11	8	41%	34%	25%
42	5	12	15	15%	38%	47%
43	12	12	8	38%	38%	25%
44	-	16	16	-	50%	50%
45	3	9	20	9%	28%	63%
46	24	8	-	75%	25%	-
47	28	4	-	87%	13%	-
48	26	4	2	81%	13%	6%
49	30	1	1	94%	3%	3%
50	30	1	1	94%	3%	3%
51	30	1	1	94%	3%	3%
52	30	1	1	94%	3%	3%
53	28	4	-	87%	13%	-
54	13	19	-	41%	59%	-
55	20	10	2	63%	31%	6%
56	28	2	2	87%	6½%	6½%
57	-	-	32	-	-	100%
58	-	-	32	-	-	100%
59	-	-	32	-	-	100%
60	-	-	32	-	-	100%

Table XIII shows the responses in terms of right, wrong and no answers on the sixty questions of the test by 24 girls in Grade One of Town E.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	18	6	-	75%	25%	-
2	22	2	-	92%	8%	-
3	17	5	2	71%	21%	8%
4	21	3	-	88%	12%	-
5	-	6	18	-	25%	75%
6	9	11	4	57%	46%	17%
7	3	8	13	13%	33%	54%
8	5	9	10	21%	37%	42%
9	6	4	14	25%	17%	58%
10	1	11	12	4%	46%	50%
11	1	3	20	4%	13%	83%
12	-	3	21	-	13%	87%
13	2	5	17	8%	21%	71%
14	-	7	17	-	29%	71%
15	23	1	-	96%	4%	-
16	24	-	-	100%	-	-
17	18	3	3	75%	12½%	12½%
18	23	-	1	96%	-	4%
19	7	7	10	29%	29%	42%
20	22	-	2	92%	-	8%
21	1	16	7	4%	67%	29%
22	14	8	2	58%	34%	8%
23	2	11	11	8%	46%	46%
24	2	14	8	8%	58%	34%
25	16	2	6	67%	8%	25%
26	6	14	4	25%	58%	17%
27	7	-	17	29%	-	71%
28	3	1	20	13%	4%	83%
29	3	3	13	13%	13%	75%
30	-	4	20	-	17%	83%
31	18	6	-	75%	25%	-
32	23	1	-	96%	4%	-
33	20	1	3	83%	4%	13%
34	18	2	4	75%	8%	17%
35	20	3	1	83%	13%	4%
36	21	1	2	88%	4%	8%
37	16	8	-	67%	33%	-
38	16	8	-	66%	33%	-
39	21	-	3	88%	-	12%
40	2	8	14	8%	45%	58%

Table XIII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	11	8	5	46%	34%	20%
42	6	4	14	25%	17%	58%
43	11	7	6	46%	29%	25%
44	-	13	11	-	54%	46%
45	5	3	16	21%	12%	67%
46	22	2	-	92%	8%	-
47	21	-	3	88%	-	12%
48	22	2	-	92%	8%	-
49	23	-	1	96%	-	4%
50	23	-	1	96%	-	4%
51	22	1	1	92%	4%	4%
52	22	1	1	92%	4%	4%
53	23	1	-	96%	4%	-
54	10	11	3	42%	45%	13%
55	11	13	-	46%	54%	-
56	22	-	2	92%	-	8%
57	-	-	24	-	-	100%
58	-	-	24	-	-	100%
59	-	-	24	-	-	100%
60	-	-	24	-	-	100%

Tables Fourteen and Fifteen show the returns of 14 boys and 15 girls of Grade One in Town F.

Town F is a town on the North Shore not far from Boston. It is typical American town with a great majority of its population either foreign born or of foreign born parents. Town B is the connecting town between this town and Town C. There are many very definite comparisons between the boys and girls of this town. Out of the sixty questions the boys and girls do not agree on sixteen. That means that they agree on only 73% of the questions.

Question one again is found to have a difference with the girls 100% and the boys only 79% but both percents are higher than the high percent, 75, of town E.

For the first time we find some children being able to count by twos. 47% of the girls could do it while only one boy, 7%, could do it. Considering the tables already analized this low percent is remarkable. Again on question six 87% of the girls could tell how many pennies there were in a nickel while only 36% of the boys knew.

On every question when there was a great difference of percent of right answers the girls did better with the exception of question 22 on how many fingers have you. In another group, Town C School 1, the girls did better but here 86% of the boys had it right and only 53% of the girls.

Tables Fourteen and Fifteen show the returns of 14 boys and 15 girls of Grade One in Town F.

Town F is a town on the North Shore not far from Boston. It is typical American town with a great majority of its population either foreign born or of foreign born parents. Town E is the connecting town between this town and Town C. There are many very definite comparisons between the boys and girls of this town. Out of the sixty questions the boys and girls do not agree on sixteen. That means that they agree on only 73% of the questions.

Question one again is found to have a difference with the girls 100% and the boys only 79% but both percents are higher than the high percent, 75, of town E.

For the first time we find some children being able to count by twos. 47% of the girls could do it while only one boy, 7%, could do it. Considering the tables already analized this low percent is remarkable. Again on question six 87% of the girls could tell how many pennies there were in a nickel while only 36% of the boys knew.

On every question when there was a great difference of percent of right answers the girls did better with the exception of question 22 on how many fingers have you. In another group, Town C School 1, the girls did better but here 86% of the boys had it right and only 53% of the girls.

On question 15, recognizing the square, the girls got 93% which was 36% better than the boys. On question 21, number of days in a week, the girls got 40% which was 26% better than the boys. On the shoe size (23) the girls got 60% which was 39% better than the boys. On the number of rooms in an egg box (24) the girls got 20% while the boys did nothing. On the latter two time questions the girls got 33% and 40% while only 14% of the boys got it right.

87% of the girls could draw a square (34) which was 30% better than the boys. 73% of the girls recognized the figures fifteen (41) while only 43% of the boys did.

The girls did better in all the simple arithmetic problems receiving 73%, 53%, 66%, 53% respectively as against the boys' 50%, 21%, 43% and 14%, showing the advantage of being a girl.

Table XIV shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 14 boys in Grade One of Town F.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	11	3	-	79%	21%	-
2	12	2	-	86%	14%	-
3	12	2	-	86%	14%	-
4	13	1	-	93%	7%	-
5	1	2	11	7%	14%	79%
6	5	1	8	36%	7%	57%
7	-	2	12	-	14%	86%
8	6	3	5	43%	21%	36%
9	7	-	7	50%	-	50%
10	1	2	11	7%	14%	79%
11	7	1	6	50%	7%	43%
12	5	1	8	36%	7%	57%
13	10	-	4	72%	-	28%
14	8	-	6	57%	-	43%
15	10	3	1	72%	21%	7%
16	13	-	1	93%	-	7%
17	6	3	5	43%	21%	36%
18	12	1	1	86%	7½%	7½%
19	8	5	1	57%	36%	7%
20	14	-	-	100%	-	-
21	2	4	8	14%	28%	57%
22	12	1	1	86%	7½%	7½%
23	3	5	6	21%	36%	43%
24	-	5	9	-	36%	64%
25	14	-	-	100%	-	-
26	12	2	-	86%	14%	-
27	6	6	2	43%	43%	14%
28	5	7	2	36%	50%	14%
29	2	9	3	14%	64%	22%
30	2	9	3	14%	64%	22%
31	10	4	-	75%	25%	-
32	10	4	-	75%	25%	-
33	12	2	-	86%	14%	-
34	8	5	1	57%	36%	7%
35	13	-	1	93%	-	7%
36	13	1	-	93%	7%	-
37	10	3	1	72%	21%	7%
38	11	3	-	79%	21%	-
39	13	-	1	93%	-	7%
40	6	4	4	43%	28%	28%
41	6	3	5	43%	21%	36%

Table XIV, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
42	11	1	2	79%	7%	14%
43	9	3	2	64%	21%	14%
44	-	8	6	-	54%	46%
45	10	2	2	72%	14%	14%
46	11	2	1	79%	14%	7%
47	14	-	-	100%	-	-
48	12	2	-	86%	14%	-
49	12	-	2	86%	-	14%
50	12	2	-	86%	14%	-
51	14	-	-	100%	-	-
52	14	-	-	100%	-	-
53	13	1	-	93%	7%	-
54	10	4	-	71%	29%	-
55	11	3	-	79%	21%	-
56	13	1	-	93%	7%	-
57	7	4	3	50%	29%	21%
58	3	5	6	21%	36%	43%
59	6	5	3	43%	36%	21%
60	2	7	5	14%	50%	36%

Table XV shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 15 girls in Grade One of Town F.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	15	-	-	100%	-	-
2	15	-	-	100%	-	-
3	15	-	-	100%	-	-
4	15	-	-	100%	-	-
5	7	-	8	47%	-	53%
6	13	-	2	87%	-	13%
7	-	-	15	-	-	100%
8	5	4	6	33%	27%	40%
9	9	-	6	60%	-	40%
10	5	2	8	33%	14%	53%
11	10	-	5	67%	-	33%
12	4	4	7	27%	27%	46%
13	13	1	1	87%	6½%	6½%
14	7	4	4	46%	27%	27%
15	14	-	1	93%	-	7%
16	14	-	1	93%	-	7%
17	9	6	-	60%	40%	-
18	15	-	-	100%	-	-
19	11	3	1	73%	20%	7%
20	14	1	-	93%	7%	-
21	6	3	6	40%	20%	40%
22	8	6	1	53%	40%	7%
23	9	3	3	60%	20%	20%
24	3	7	5	20%	47%	33%
25	13	2	-	87%	13%	-
26	13	2	-	87%	13%	-
27	8	6	1	53%	40%	7%
28	7	5	3	47%	33%	20%
29	5	8	2	33%	54%	13%
30	6	8	1	40%	53%	7%
31	12	3	-	80%	20%	-
32	12	3	-	80%	20%	-
33	14	1	-	93%	7%	-
34	13	2	-	87%	13%	-
35	14	-	-	93%	-	7%
36	14	-	1	93%	-	7%
37	13	1	1	87%	6½%	6½%
38	13	2	-	87%	13%	-
39	14	1	-	93%	7%	-
40	10	4	1	66%	27%	7%

Table XV, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	11	3	1	73%	20%	7%
42	13	-	2	87%	-	13%
43	10	2	3	67%	13%	20%
44	-	8	7	-	53%	47%
45	13	2	-	87%	13%	-
46	12	2	1	80%	13%	7%
47	14	-	1	93%	-	7%
48	11	3	1	73%	20%	7%
49	14	-	1	93%	-	7%
50	14	-	1	93%	-	7%
51	14	-	1	93%	-	7%
52	13	1	1	87%	6½%	6½%
53	14	1	-	93%	7%	-
54	11	4	-	73%	27%	-
55	12	3	-	80%	20%	-
56	15	-	-	100%	-	-
57	11	3	1	73%	20%	7%
58	8	5	2	53%	33%	14%
59	10	4	1	66%	27%	7%
60	8	5	2	53%	33%	14%

Tables Sixteen and seventeen show the returns of 26 boys and 24 girls of Grade Two in Town B.

In running over the percent of right answers there is only four instances where there is a difference of 20% or more in the answers of the boys as opposed to the girls. It shows the boys and girls of this grade to be quite similar in their arithmetical interests and growth. This may be due to the fact that arithmetic has been taught to them as a whole ever since they entered school.

On three of the four questions the girls showed the greater ability. 83% of the girls got question 12, on the cost of bread, right, while only 62% of the boys had it. 62% of the girls knew the school milk bottle while 88% of the boys knew it. This question has been noted before in grade one for the variations of the boys and girls. 62% of the girls knew when the noon whistles blew (29) which was 20% better than the boys. 87% of the girls recognized 15 (41) as against 65% of the boys.

There were several variations in this test ranging from 1 to 16 but only these four in the twenties and none above that which shows a very good distribution between the boys and girls.

Tables Sixteen and seventeen show the returns of 26 boys and 24 girls of Grade Two in Town 3.

In running over the percent of right answers there is only four instances where there is a difference of 20% or more in the answers of the boys as opposed to the girls. It shows the boys and girls of this grade to be quite similar in their arithmetical interests and growth. This may be due to the fact that arithmetic has been taught to them as a whole ever since they entered school.

On three of the four questions the girls showed the greater ability. 83% of the girls got question 12, on the cost of bread, right, while only 62% of the boys had it. 62% of the girls knew the school milk bottle while 88% of the boys knew it. This question has been noted before in grade one for the variations of the boys and girls. 62% of the girls knew when the noon whistles blew (29) which was 20% better than the boys. 87% of the girls recognized 15 (41) as against 65% of the boys.

There were several variations in this test ranging from 1 to 16 but only these four in the twenties and none above that which shows a very good distribution between the boys and girls.

Table XVI shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 26 boys in Grade 2 of Town B.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	26	-	-	100%	-	-
2	26	-	-	100%	-	-
3	26	-	-	100%	-	-
4	23	1	2	88%	4%	8%
5	17	8	1	65%	31%	4%
6	21	5	-	81%	19%	-
7	7	19	-	27%	73%	-
8	19	4	3	73%	17%	12%
9	24	2	-	92%	8%	-
10	19	6	1	73%	23%	4%
11	21	2	3	81%	8%	12%
12	16	10	-	62%	38%	-
13	24	2	-	92%	8%	-
14	21	4	1	81%	21%	4%
15	26	-	-	100%	-	-
16	24	1	1	92%	4%	4%
17	20	5	1	77%	19%	4%
18	25	-	1	96%	-	4%
19	19	6	1	73%	23%	4%
20	24	2	-	92%	8%	-
21	20	5	1	77%	19%	4%
22	25	-	1	96%	-	4%
23	15	10	1	58%	38%	4%
24	10	14	2	38%	54%	8%
25	22	3	1	85%	12%	4%
26	23	3	-	88%	12%	-
27	19	6	1	73%	23%	4%
28	19	6	1	73%	23%	4%
29	11	14	1	42%	54%	4%
30	7	15	4	27%	58%	15%
31	21	5	-	81%	19%	-
32	24	2	-	92%	8%	-
33	17	5	4	65%	19%	16%
34	19	5	2	73%	19%	8%
35	26	-	-	100%	-	-
36	26	-	-	100%	-	-
37	22	4	-	85%	15%	-
38	21	5	-	81%	19%	-
39	21	5	-	81%	19%	-
40	17	7	2	65%	27%	8%

Table XVI, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	17	9	-	65%	35%	-
42	18	6	2	69%	23%	8%
43	14	12	-	54%	46%	-
44	7	19	-	27%	73%	-
45	21	5	-	81%	19%	-
46	26	-	-	100%	-	-
47	26	-	-	100%	-	-
48	25	1	-	96%	4%	-
49	26	-	-	100%	-	-
50	25	1	-	96%	4%	-
51	26	-	-	100%	-	-
52	26	-	-	100%	-	-
53	25	-	1	96%	-	4%
54	12	13	1	46%	50%	4%
55	17	9	-	65%	35%	-
56	24	1	1	92%	4%	4%
57	22	2	2	84%	8%	8%
58	14	11	1	54%	42%	4%
59	9	3	14	34%	54%	12%
60	9	3	14	34%	54%	12%

Table XVII shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 24 girls in Grade 2 of Town B.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	21	2	1	87%	8%	4%
2	20	3	1	83%	13%	4%
3	21	3	-	87%	13%	-
4	21	3	-	87%	13%	-
5	15	9	-	62%	38%	-
6	18	3	3	75%	12½%	12½%
7	10	13	1	42%	54%	4%
8	17	4	3	70%	17%	13%
9	19	5	-	79%	21%	-
10	21	2	1	87%	9%	4%
11	21	3	-	87%	13%	-
12	20	4	-	83%	17%	-
13	19	4	1	79%	17%	4%
14	21	3	-	87%	13%	-
15	24	-	-	100%	-	-
16	24	-	-	100%	-	-
17	21	2	1	87%	9%	4%
18	24	-	-	100%	-	-
19	21	3	-	87%	13%	-
20	24	-	-	100%	-	-
21	16	7	1	64%	29%	4%
22	23	-	1	96%	-	4%
23	16	7	1	64%	29%	4%
24	13	10	1	54%	42%	4%
25	21	2	1	87%	9%	4%
26	15	9	-	62%	38%	-
27	20	4	-	83%	17%	-
28	20	4	-	83%	17%	-
29	15	9	-	62%	38%	-
30	7	15	2	29%	63%	8%
31	23	1	-	96%	4%	-
32	23	1	-	96%	4%	-
33	19	2	3	79%	8%	13%
34	16	4	4	67%	16½%	16½%
35	21	1	2	87%	4%	9%
36	24	-	-	100%	-	-
37	21	3	-	87%	13%	-
38	21	3	-	87%	13%	-
39	20	-	4	83%	-	17%
40	21	2	1	87%	9%	4%

Table XVII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	15	6	3	62%	25%	13%
42	19	4	1	79%	17%	4%
43	17	5	2	71%	20%	9%
44	9	14	1	37%	59%	4%
45	17	5	2	71%	20%	9%
46	23	1	-	96%	4%	-
47	24	-	-	100%	-	-
48	22	2	-	91%	9%	-
49	24	-	-	100%	-	-
50	22	-	2	91%	-	9%
51	23	-	1	96%	-	4%
52	23	-	1	96%	-	4%
53	22	1	1	91%	4½%	4½%
54	11	13	-	46%	54%	-
55	16	8	-	67%	33%	-
56	23	1	-	96%	4%	-
57	19	5	-	79%	21%	-
58	10	14	-	42%	58%	-
59	7	14	3	29%	58%	13%
60	7	14	3	29%	58%	13%

Tables Eighteen and Nineteen show the returns of 20 boys and 19 girls of Grade 2, Town C, School 1.

Like Town B, Grade 2, there is very little difference in the percentage of right answers.

There are many questions where the boys and girls differ up to ten points. There are around eleven questions where the percentage of right answers differ between ten and twenty points.

There are only two places where the difference is more than twenty but they are still less than thirty.

One of these questions was recognizing the dollar mark (8). 89% of the girls got it right, which is 24% better than the boys who have only 65%.

Again we come to the shoe size (23). This question has not come up very often. Here, as in the kindergarten, the girls did better, 79% of them getting it right as against 55% for the boys.

The test was given here about three months later than it was given to Town B. This may explain the still higher correlation between the boys and girls.

Table XVIII shows the responses in terms of right, wrong and no answer, on the sixty questions of the test by 20 boys in Grade Two of Town C, School 1.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	20	-	-	100%	-	-
2	20	-	-	100%	-	-
3	19	1	-	95%	5%	-
4	20	-	-	100%	-	-
5	-	-	20	-	-	100%
6	18	-	2	90%	-	10%
7	6	-	14	30%	-	70%
8	13	-	7	65%	-	35%
9	18	-	2	90%	-	10%
10	18	2	-	90%	10%	-
11	-	-	20	-	-	100%
12	12	1	7	60%	5%	35%
13	17	-	3	85%	-	15%
14	19	1	-	95%	5%	-
15	20	-	-	100%	-	-
16	20	-	-	100%	-	-
17	19	1	-	95%	5%	-
18	20	-	-	100%	-	-
19	19	1	-	95%	5%	-
20	20	-	-	100%	-	-
21	12	5	3	50%	25%	15%
22	8	12	-	40%	60%	-
23	11	5	4	55%	25%	20%
24	5	4	11	25%	20%	55%
25	14	5	1	70%	25%	5%
26	15	5	-	75%	25%	-
27	9	6	5	45%	30%	25%
28	9	4	7	45%	20%	35%
29	8	6	6	40%	30%	30%
30	7	7	6	35%	35%	30%
31	19	1	-	95%	5%	-
32	19	1	-	95%	5%	-
33	20	-	-	100%	-	-
34	20	-	-	100%	-	-
35	19	-	1	95%	-	5%
36	20	-	-	100%	-	-
37	16	4	-	80%	20%	-
38	17	3	-	85%	15%	-
39	18	-	2	90%	-	10%
40	18	1	1	90%	5%	5%

Table XVIII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	15	4	1	75%	20%	5%
42	19	-	1	95%	-	5%
43	17	2	1	85%	10%	5%
44	5	10	5	25%	50%	25%
45	17	2	1	85%	10%	5%
46	20	-	-	100%	-	-
47	20	-	-	100%	-	-
48	19	1	-	95%	5%	-
49	19	-	1	95%	-	5%
50	20	-	-	100%	-	-
51	20	-	-	100%	-	-
52	20	-	-	100%	-	-
53	20	-	-	100%	-	-
54	15	5	-	75%	25%	-
55	18	2	-	90%	10%	-
56	20	-	-	100%	-	-
57	20	-	-	100%	-	-
58	20	-	-	100%	-	-
59	20	-	-	100%	-	-
60	20	-	-	100%	-	-

Table XIX shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 19 girls of Grade Two in Town C, School 1.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	19	-	-	100%	-	-
2	18	1	-	95%	5%	-
3	18	1	-	95%	5%	-
4	19	-	-	100%	-	-
5	-	-	19	-	-	100%
6	17	-	2	89%	-	11%
7	5	-	14	26%	-	74%
8	17	-	2	89%	-	11%
9	19	-	-	100%	-	-
10	19	-	-	100%	-	-
11	-	-	19	-	-	100%
12	8	1	10	42%	5%	53%
13	15	-	4	79%	-	21%
14	17	-	2	89%	-	11%
15	18	1	-	95%	5%	-
16	19	-	-	100%	-	-
17	17	2	-	89%	11%	-
18	19	-	-	100%	-	-
19	18	1	-	95%	5%	-
20	19	-	-	100%	-	-
21	12	3	4	63%	16%	21%
22	7	12	-	37%	63%	-
23	15	-	4	79%	-	21%
24	5	2	12	26%	11%	63%
25	10	8	1	53%	42%	5%
26	13	6	-	68%	32%	-
27	12	1	6	63%	5%	32%
28	9	2	8	47%	11%	42%
29	11	3	5	58%	16%	26%
30	10	1	8	53%	5%	42%
31	17	2	-	89%	11%	-
32	19	-	-	100%	-	-
33	19	-	-	100%	-	-
34	19	-	-	100%	-	-
35	19	-	-	100%	-	-
36	19	-	-	100%	-	-
37	18	1	-	95%	5%	-
38	18	1	-	95%	5%	-
39	19	-	-	100%	-	-
40	19	-	-	100%	-	-

Table XIX, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	16	3	-	84%	16%	-
42	18	-	1	95%	-	5%
43	19	-	-	100%	-	-
44	5	4	10	26%	21%	53%
45	18	-	1	95%	-	5%
46	19	-	-	100%	-	-
47	18	-	1	95%	-	5%
48	19	-	-	100%	-	-
49	19	-	-	100%	-	-
50	19	-	-	100%	-	-
51	19	-	-	100%	-	-
52	19	-	-	100%	-	-
53	17	2	-	89%	11%	-
54	16	3	-	84%	16%	-
55	17	2	-	89%	11%	-
56	18	1	-	95%	5%	-
57	18	1	-	95%	5%	-
58	18	1	-	95%	5%	-
59	19	-	-	100%	-	-
60	19	-	-	100%	-	-

Tables Twenty and Twenty-one show the returns of 38 boys and 34 girls of Grade Two in Town C, School 2.

As in School 1 of Town C the parallel between the boys and girls in the percentage of right answers have less than ten points of difference between the boys and girls. 18% of the answers had between ten and twenty points of difference in the percentage of right answers. 5% of the answers were over twenty points of difference, meaning just three questions.

Two of these questions were copying a geometric figure (31 and 32). The girls did better in both questions. The girls were 94% and 97% while the boys went down 74% and 71%, respectively, on the two questions. The difference between the boys and girls is 20% (31) and 26% (32).

The word over (55) made trouble for the firls. They only got 38% while the boys got 79%.

Table XX shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 38 boys in Grade Two of Town C, School 2.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	33	5	-	87%	13%	-
2	35	3	-	92%	8%	-
3	35	3	-	92%	8%	-
4	35	3	-	92%	8%	-
5	-	-	38	-	-	100%
6	36	1	1	95%	2½%	2½%
7	5	2	31	13%	5%	82%
8	28	8	2	74%	21%	5%
9	31	4	3	82%	10%	8%
10	29	6	3	76%	16%	8%
11	-	-	38	-	-	100%
12	22	4	12	58%	10%	32%
13	33	-	5	87%	-	13%
14	32	1	5	84%	3%	13%
15	35	1	2	92%	3%	5%
16	35	-	3	92%	-	8%
17	37	1	-	97%	3%	-
18	38	-	-	100%	-	-
19	29	7	2	77%	18%	5%
20	36	-	2	95%	-	5%
21	20	11	7	53%	29%	18%
22	24	14	-	63%	37%	-
23	21	7	10	55%	18%	27%
24	11	7	20	29%	18%	53%
25	38	-	-	100%	-	-
26	23	13	2	60%	35%	5%
27	25	7	6	66%	18%	16%
28	21	8	9	55%	21%	24%
29	21	11	6	55%	29%	16%
30	18	10	10	46%	27%	27%
31	28	2	8	74%	5%	21%
32	27	3	8	71%	8%	21%
33	32	-	6	84%	-	16%
34	33	1	4	87%	3%	10%
35	36	1	1	95%	2½%	2½%
36	38	-	-	100%	-	-
37	38	-	-	100%	-	-
38	38	-	-	100%	-	-
39	36	-	2	95%	-	5%
40	33	3	2	87%	8%	5%

Table XX, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	32	6	-	74%	16%	-
42	32	3	3	74%	8%	8%
43	31	5	2	82%	13%	5%
44	3	15	20	8%	39%	53%
45	34	2	2	90%	5%	5%
46	38	-	-	100%	-	-
47	37	-	1	97%	-	3%
48	37	1	-	97%	3%	-
49	38	-	-	100%	-	-
50	37	1	-	97%	3%	-
51	38	-	-	100%	-	-
52	38	-	-	100%	-	-
53	35	3	-	92%	8%	-
54	23	15	-	60%	40%	-
55	30	7	1	79%	18%	3%
56	37	1	-	97%	3%	-
57	27	-	11	71%	-	29%
58	19	6	13	50%	16%	34%
59	24	2	12	63%	5%	32%
60	15	1	22	39%	3%	58%

Table XXI shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 34 girls in Grade Two of Town C, School 2.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	30	3	1	88%	9%	3%
2	33	1	-	97%	3%	-
3	34	-	-	100%	-	-
4	34	-	-	100%	-	-
5	-	-	34	-	-	100%
6	31	1	2	91%	3%	6%
7	1	1	32	3%	3%	94%
8	23	6	5	68%	17%	15%
9	30	1	3	88%	3%	9%
10	32	2	-	94%	6%	-
11	-	-	34	-	-	100%
12	15	2	17	44%	6%	50%
13	27	1	6	80%	3%	17%
14	29	1	4	85%	3%	12%
15	33	1	-	97%	3%	-
16	32	1	1	94%	3%	3%
17	32	2	-	94%	6%	-
18	32	1	1	94%	3%	3%
19	30	3	1	88%	9%	3%
20	33	1	-	97%	3%	-
21	18	8	8	53%	24%	24%
22	21	13	-	62%	38%	-
23	23	2	9	68%	5%	27%
24	11	7	16	32%	21%	47%
25	31	3	-	91%	9%	-
26	20	13	1	59%	38%	3%
27	26	4	4	77%	11½%	11½%
28	22	6	6	65%	17½%	17½%
29	22	8	4	65%	24%	12%
30	22	7	5	65%	21%	14%
31	32	2	-	94%	6%	-
32	33	1	-	97%	3%	-
33	32	-	2	94%	-	6%
34	32	-	2	94%	-	6%
35	32	2	-	94%	6%	-
36	34	-	-	100%	-	-
37	33	1	-	97%	3%	-
38	34	-	-	100%	-	-
39	33	1	-	97%	3%	-
40	30	3	1	88%	9%	3%

Table XXI, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	24	9	1	71%	26%	3%
42	30	1	3	88%	3%	9%
43	29	5	-	85%	15%	-
44	3	24	7	9%	70%	21%
45	31	-	3	91%	-	9%
46	34	-	-	100%	-	-
47	34	-	-	100%	-	-
48	34	-	-	100%	-	-
49	34	-	-	100%	-	-
50	34	-	-	100%	-	-
51	34	-	-	100%	-	-
52	34	-	-	100%	-	-
53	31	3	-	91%	9%	-
54	21	13	-	62%	38%	-
55	13	19	2	38%	56%	6%
56	34	-	-	100%	-	-
57	24	3	7	71%	9%	20%
58	18	6	10	53%	18%	29%
59	21	3	10	62%	9%	29%
60	15	2	17	44%	6%	50%

Tables Twenty-two and Twenty-three show the returns of ten boys and thirteen girls of Grade Two in Town D.

Ten points difference in 55% of the right answer of the boys in comparison with the girls. In this 55% of large difference in right answers between boys and girls 37% was between 10 and 20 points of difference while 18% was more than 20 points. The girls showed off to a much better advantage than the boys. Out of this 37%, 33% of the girls' answers were higher than the boys, leaving the boys only 3% of the higher answers.

The 18% of percent of right answers where the difference between the boys and girls was more than 20 points were found in the following questions:

We find for the first time a difference in question 2, finding the sixth fish. The girls got 100% which was 20% higher than the boys.

Again the dollar mark (8) shows a controversy as did the next two money questions, finding milk money (10) and Red Cross money (11). Question ten has been found frequently in this analysis of boys and girls. Girls 92%, 92%, 62% and 46%, boys 70%, 70%, 70% and 30%. In the first two questions the girls were 22% higher than the boys but in the last question the boys were 32% higher which is the highest percent of difference found so far.

Questions Sixteen and Nineteen, recognizing a circle and middle block were easier for the girls. They knew it 100% while 20% of the boys didn't know it.

The days of the week (21) again is known better to the boys who had 100% which was 22% higher than the girls.

54% of the girls knew when to start for school while only 30% of the boys knew.

Likewise, 92% of the girls could draw a square which was 22% higher than the boys.

22% in many of the cases in this group seems to be the point of difference. It may possibly be the same children in each case where the difference is so constant.

Questions Sixteen and Nineteen, recognizing a circle and middle block were easier for the girls. They knew it 100% while 20% of the boys didn't know it.

The days of the week (21) again is known better to the boys who had 100% which was 32% higher than the girls.

54% of the girls knew when to start for school while only 30% of the boys knew.

Likewise, 52% of the girls could draw a square which was 22% higher then the boys.

22% in many of the cases in this group seems to be the point of difference. It may possibly be the same children in each case where the difference is so constant.

Table XXII shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 10 boys in Grade 2 of Town D.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	8	1	1	80%	10%	10%
2	8	2	-	80%	20%	-
3	10	-	-	100%	-	-
4	9	1	-	90%	10%	-
5	8	2	-	80%	20%	-
6	8	2	-	80%	20%	-
7	3	4	3	30%	40%	30%
8	5	3	2	50%	30%	20%
9	7	3	-	70%	30%	-
10	7	2	1	70%	20%	10%
11	3	5	2	30%	50%	20%
12	6	4	-	60%	40%	-
13	5	5	-	50%	50%	-
14	6	4	-	60%	40%	-
15	9	1	-	90%	10%	-
16	8	1	1	80%	10%	10%
17	8	1	1	80%	10%	10%
18	9	-	1	90%	-	10%
19	7	3	-	70%	30%	-
20	10	-	-	100%	-	-
21	10	-	-	100%	-	-
22	6	4	-	60%	40%	-
23	6	3	1	60%	30%	10%
24	5	4	1	50%	40%	10%
25	9	1	-	90%	10%	-
26	4	6	-	40%	60%	-
27	5	5	-	50%	50%	-
28	6	4	-	60%	40%	-
29	8	2	-	80%	20%	-
30	3	6	1	30%	60%	10%
31	8	2	-	80%	20%	-
32	10	-	-	100%	-	-
33	9	-	1	90%	-	10%
34	7	1	2	70%	10%	20%
35	8	1	1	80%	10%	10%
36	9	1	-	90%	10%	-
37	10	-	-	100%	-	-
38	10	-	-	100%	-	-
39	9	-	1	90%	-	10%
40	9	1	-	90%	10%	-

Table XXII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	7	3	-	70%	30%	-
42	8	2	-	80%	20%	-
43	9	-	1	90%	-	-
44	4	5	1	40%	50%	10%
45	10	-	-	100%	-	-
46	10	-	-	100%	-	-
47	10	-	-	100%	-	-
48	10	-	-	100%	-	-
49	10	-	-	100%	-	-
50	10	-	-	100%	-	-
51	10	-	-	100%	-	-
52	10	-	-	100%	-	-
53	10	-	-	100%	-	-
54	8	2	-	80%	20%	-
55	9	1	-	90%	10%	-
56	10	-	-	100%	-	-
57	7	3	-	70%	30%	-
58	5	4	1	50%	40%	10%
59	5	5	-	50%	50%	-
60	5	5	-	50%	50%	-

Table XXIII shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 13 girls in Grade Two of Town D.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	10	3	-	77%	23%	-
2	13	-	-	100%	-	-
3	13	-	-	100%	-	-
4	12	1	-	92%	8%	-
5	12	1	-	92%	8%	-
6	12	-	1	92%	-	8%
7	4	5	4	31%	38%	31%
8	10	2	1	77%	15%	8%
9	12	-	1	92%	-	8%
10	12	1	-	92%	8%	-
11	8	3	2	62%	23%	15%
12	6	5	2	46%	39%	15%
13	7	6	-	54%	46%	-
14	10	3	-	77%	23%	-
15	13	-	-	100%	-	-
16	13	-	-	100%	-	-
17	12	1	-	92%	8%	-
18	13	-	-	100%	-	-
19	12	1	-	92%	8%	-
20	13	-	-	100%	-	-
21	10	3	-	77%	23%	-
22	10	3	-	77%	23%	-
23	9	1	3	69%	8%	23%
24	8	5	-	61%	39%	-
25	12	1	-	92%	8%	-
26	6	7	-	46%	54%	-
27	9	4	-	69%	31%	-
28	9	4	-	69%	31%	-
29	8	3	2	61%	24%	15%
30	7	5	1	54%	38%	8%
31	10	1	2	77%	8%	15%
32	13	-	-	100%	-	-
33	12	1	-	92%	88%	-
34	12	1	-	92%	8%	-
35	12	1	-	92%	8%	-
36	13	-	-	100%	-	-
37	13	-	-	100%	-	-
38	13	-	-	100%	-	-
39	13	-	-	100%	-	-
40	12	1	-	92%	8%	-
41	11	2	-	85%	15%	-
42	11	2	-	85%	15%	-

Table XXIII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
43	13	-	-	100%	-	-
44	7	5	1	54%	38%	8%
45	13	-	-	100%	-	-
46	13	-	-	100%	-	-
47	13	-	-	100%	-	-
48	11	2	-	85%	15%	-
49	12	-	1	92%	-	8%
50	12	-	1	92%	-	8%
51	12	-	1	92%	-	8%
52	13	-	-	100%	-	-
53	13	-	-	100%	-	-
54	10	3	-	77%	23%	-
55	10	3	-	77%	23%	-
56	12	1	-	92%	8%	-
57	12	1	-	92%	8%	-
58	9	3	1	69%	23%	8%
59	9	2	2	69%	15½%	15½%
60	9	2	2	69%	15½%	15½%

Tables Twenty-four and Twenty-five show the returns of 21 boys and 30 girls of Grade Two in Town E.

There is found in an analysis of this Grade a very wide difference in 12% of the questions. In 25% of the answers the difference between the right answers of the girls and boys is more than 10 points. 13% of this 25% is between ten and twenty points, 6½% boys and 6½% girls, showing that the boys know better an equal number of the problems.

12% of the answers show more than 20 points of difference, 5% being girls and 7% boys. The boys and girls in this school and grade run more closely as to percentage of most answers right than in any other group thus far.

Question five, counting by two's, showed a greater comparison than has yet been found. 91% of the boys had the question right which was 41% higher than the girls.

Question ten, on milk money, shows a difference of 34% with 44% of the girls getting it right as against 10% of the boys.

There is 21% of difference between the boys (43%) and the girls (64%) in question eleven on Red Cross money.

It is found again that the girls knew their fingers (22) better with 67% while only 43% of the boys knew it.

The same is true of the shoe size (23) where 77% of the girls knew it, which was 20% better than the boys.

The boys knew the rooms in an egg box better than the girls getting 67% while the girls received 40%. This is controversial to some of the previous analysis.

53% of the boys could write a three place number while only 33% of the girls could do it.

The same is true of the shoe size (23) where 77% of the girls knew it, which was 20% better than the boys.

The boys knew the rooms in an egg box better than the girls getting 67% while the girls received 40%. This is controversial to some of the previous analysis.

53% of the boys could write a three place number while only 33% of the girls could do it.

Table XXIV shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 21 boys in Grade Two of Town E.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	20	1	-	96%	4%	-
2	21	-	-	100%	-	-
3	21	-	-	100%	-	-
4	20	1	-	96%	4%	-
5	19	-	2	91%	-	9%
6	16	2	3	76%	9%	15%
7	10	10	1	48%	48%	4%
8	18	3	-	86%	14%	-
9	20	1	-	96%	4%	-
10	2	18	1	10%	85½%	4½%
11	9	10	2	43%	48%	9%
12	14	5	2	67%	24%	9%
13	17	3	1	82%	14%	4%
14	18	2	1	86%	10%	4%
15	19	2	-	91%	9%	-
16	19	2	-	91%	9%	-
17	19	2	-	91%	9%	-
18	19	-	2	91%	-	9%
19	15	5	1	72%	24%	4%
20	19	-	2	91%	-	9%
21	16	4	1	76%	20%	4%
22	9	11	1	43%	53%	4%
23	12	8	1	57%	39%	4%
24	14	6	1	67%	29%	4%
25	19	1	1	92%	4%	4%
26	16	4	1	76%	20%	4%
27	20	1	-	96%	4%	-
28	20	1	-	96%	4%	-
29	12	9	-	57%	43%	-
30	16	3	2	76%	15%	9%
31	19	1	1	92%	4%	4%
32	20	-	1	96%	-	4%
33	20	-	1	96%	-	4%
34	21	-	-	100%	-	-
35	21	-	-	100%	-	-
36	20	1	-	96%	4%	-
37	19	1	1	92%	4%	4%
38	19	1	1	92%	4%	4%
39	20	-	1	96%	-	4%
40	18	1	2	87%	4%	8%

Table XXIV, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	17	2	2	82%	9%	9%
42	18	2	1	87%	9%	4%
43	18	2	1	87%	9%	4%
44	11	9	1	53%	43%	4%
45	20	-	1	96%	-	4%
46	20	1	-	96%	4%	-
47	20	1	-	96%	4%	-
48	16	5	-	76%	24%	-
49	21	-	-	100%	-	-
50	21	-	-	100%	-	-
51	21	-	-	100%	-	-
52	21	-	-	100%	-	-
53	20	1	-	96%	4%	-
54	16	5	-	76%	24%	-
55	12	8	1	58%	38%	4%
56	19	1	1	92%	4%	4%
57	18	2	1	87%	9%	4%
58	17	1	3	82%	4%	14%
59	14	4	3	67%	19%	14%
60	14	4	3	67%	19%	14%

Table XXV shows the responses in terms of right, wrong and no answer on the sixty questions of the test by 30 girls in Grade Two of Town E.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	25	4	1	84%	13%	3%
2	30	-	-	100%	-	-
3	30	-	-	100%	-	-
4	27	2	1	90%	6%	3%
5	15	15	-	50%	50%	-
6	26	4	-	87%	13%	-
7	14	16	-	47%	53%	-
8	28	1	1	93%	3½%	3½%
9	27	3	-	90%	10%	-
10	13	16	1	44%	53%	3%
11	19	10	1	64%	33%	3%
12	19	11	-	64%	36%	-
13	26	3	1	87%	10%	3%
14	27	3	-	90%	10%	-
15	26	4	-	87%	13%	-
16	24	3	3	80%	10%	10%
17	24	1	5	80%	3%	17%
18	30	-	-	100%	-	-
19	22	8	-	74%	25%	-
20	30	-	-	100%	-	-
21	22	7	1	74%	23%	3%
22	20	7	3	67%	23%	10%
23	23	7	-	77%	23%	-
24	12	18	-	40%	60%	-
25	26	4	-	87%	17%	-
26	18	12	-	60%	40%	-
27	29	1	-	97%	3%	-
28	18	1	1	93%	3½%	3½%
29	19	11	-	64%	36%	-
30	26	3	1	87%	10%	3%
31	29	1	-	97%	3%	-
32	38	2	-	94%	6%	-
33	29	1	-	97%	3%	-
34	29	1	-	97%	3%	-
35	29	1	-	97%	3%	-
36	30	-	-	100%	-	-
37	28	2	-	94%	6%	-
38	28	2	-	94%	6%	-
39	27	1	2	91%	3%	6%
40	27	3	1	87%	10%	3%

Table XXV, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	26	3	1	87%	10%	3%
42	25	4	1	84%	13%	3%
43	22	8	-	74%	26%	-
44	10	20	-	33%	67%	-
45	29	1	-	97%	3%	-
46	29	1	-	97%	3%	-
47	29	1	-	97%	3%	-
48	23	7	-	77%	23%	-
49	30	-	-	100%	-	-
50	30	-	-	100%	-	-
51	29	-	1	97%	-	3%
52	30	-	-	100%	-	-
53	30	-	-	100%	-	-
54	21	9	-	70%	30%	-
55	21	9	-	70%	30%	-
56	30	-	-	100%	-	-
57	28	2	1	91%	6%	3%
58	26	4	-	87%	13%	-
59	24	5	1	80%	17%	3%
60	19	5	6	63%	17%	20%

Tables Twenty-six and Twenty-seven show the returns of 12 boys and 13 girls of Grade Two in Town F.

In glancing over these two tables the column of right answers and percentage of right answers is most noticeable. The 100%'s and very high figures all through the percentage of right answers is most interesting. This group from Town F were given the test later (March) than any other group therefore they were able to have picked up more information than Town B where the test was given in November.

Again we find the boys differing from the girls more than 10 points in 25% of the percentage of right answers.

18% out of this 25% showed between 10 and 20 points of difference while out of this 10% of the highest percentages were girls and 8% boys.

This means that 7% of the differences were over twenty points which was only four questions. This is better than the majority of second grades.

Out of the four questions three of them are very frequent questions of comparisons.

Question twenty-two on the number of fingers was yet again better known to the girls, 77% of them got it right which was 35% better than the boys.

In the question on recognizing the schoolroom milk bottle (26) only 38% of the girls knew it while 67% of the boys knew it.

In recognizing the number fifteen (41) all the boys knew it while only 69% of the girls knew it.

All the boys could divide a house in half (48) while only 67% of the girls could do it.

Table XXVI shows the responses in terms of right, wrong and no answer, on the sixty questions of the test by 12 boys in Grade 2 of Town F.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	12	-	-	100%	-	-
2	12	-	-	100%	-	-
3	12	-	-	100%	-	-
4	12	-	-	100%	-	-
5	11	1	-	92%	8%	-
6	12	-	-	100%	-	-
7	11	1	-	92%	8%	-
8	10	2	-	83%	17%	-
9	12	-	-	100%	-	-
10	10	2	-	83%	17%	-
11	9	2	1	75%	17%	8%
12	12	-	-	100%	-	-
13	12	-	-	100%	-	-
14	12	-	-	100%	-	-
15	12	-	-	100%	-	-
16	12	-	-	100%	-	-
17	9	2	1	75%	17%	8%
18	12	-	-	100%	-	-
19	8	3	1	67%	25%	8%
20	12	-	-	100%	-	-
21	11	1	-	92%	8%	-
22	5	7	-	42%	58%	-
23	12	-	-	100%	-	-
24	11	1	-	92%	8%	-
25	10	2	-	83%	17%	-
26	8	4	-	67%	33%	-
27	11	1	-	92%	8%	-
28	11	1	-	92%	8%	-
29	9	3	-	75%	25%	-
30	10	1	1	84%	8%	8%
31	12	-	-	100%	-	-
32	12	-	-	100%	-	-
33	12	-	-	100%	-	-
34	12	-	-	100%	-	-
35	12	-	-	100%	-	-
36	12	-	-	100%	-	-
37	11	1	-	92%	8%	-
38	11	1	-	92%	8%	-
39	12	-	-	100%	-	-
40	11	1	-	92%	8%	-

Table XXVI, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	12	-	-	100%	-	-
42	12	-	-	100%	-	-
43	11	1	-	92%	8%	-
44	6	6	-	50%	50%	-
45	12	-	-	100%	-	-
46	12	-	-	100%	-	-
47	12	-	-	100%	-	-
48	8	4	-	67%	33%	-
49	12	-	-	100%	-	-
50	12	-	-	100%	-	-
51	12	-	-	100%	-	-
52	10	1	1	84%	8%	8%
53	12	-	-	100%	-	-
54	11	-	1	92%	-	8%
55	10	2	-	84%	16%	-
56	11	1	-	92%	8%	-
57	12	-	-	100%	-	-
58	12	-	-	100%	-	-
59	12	-	-	100%	-	-
60	12	-	-	100%	-	-

Table XXVII shows the responses in terms of right, wrong and no answer on the sixty question of the test by 13 girls in Grade Two of Town F.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	13	-	-	100%	-	-
2	13	-	-	100%	-	-
3	13	-	-	100%	-	-
4	12	-	1	92%	-	8%
5	12	-	1	92%	-	8%
6	12	1	-	92%	8%	-
7	12	1	-	92%	8%	-
8	11	2	-	85%	15%	-
9	13	-	-	100%	-	-
10	13	-	-	100%	-	-
11	12	-	1	92%	-	8%
12	11	2	-	85%	15%	-
13	13	-	-	100%	-	-
14	12	-	1	92%	-	8%
15	12	-	1	92%	-	8%
16	13	-	-	100%	-	-
17	8	3	2	62%	23%	15%
18	13	-	-	100%	-	-
19	8	5	-	62%	38%	-
20	13	-	-	100%	-	-
21	13	-	-	100%	-	-
22	10	2	1	77%	15%	8%
23	12	1	-	92%	8%	-
24	13	-	-	100%	-	-
25	13	-	-	100%	-	-
26	5	8	-	38%	62%	-
27	13	-	-	100%	-	-
28	12	-	1	92%	-	8%
29	12	-	1	92%	-	8%
30	11	1	1	84%	8%	8%
31	12	1	-	92%	8%	-
32	11	2	-	85%	15%	-
33	13	-	-	100%	-	-
34	12	-	1	92%	-	8%
35	12	-	1	92%	-	8%
36	13	-	-	100%	-	-
37	13	-	-	100%	-	-
38	12	1	-	92%	8%	-
39	13	-	-	100%	-	-
40	11	2	-	85%	15%	-

Table XXVII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	9	3	1	69%	23%	8%
42	13	-	-	100%	-	-
43	11	2	-	85%	15%	-
44	9	4	-	69%	31%	-
45	13	-	-	100%	-	-
46	13	-	-	100%	-	-
47	13	-	-	100%	-	-
48	13	-	-	100%	-	-
49	13	-	-	100%	-	-
50	13	-	-	100%	-	-
51	13	-	-	100%	-	-
52	13	-	-	100%	-	-
53	12	1	-	92%	8%	-
54	10	3	-	77%	23%	-
55	13	-	-	100%	-	-
56	13	-	-	100%	-	-
57	13	-	-	100%	-	-
58	11	1	1	84%	8%	8%
59	12	-	1	92%	-	8%
60	12	-	1	92%	-	8%

The next six tables, twenty-eight through thirty-four, deal with the first grades as wholes of the six schools in Towns B, C, D, E and F.

Tables twenty-eight and twenty-nine are the returns from two neighboring towns.

In comparing the two towns it was found that Town B (Table 28) was much higher than Town C. Taking those percentages of right answers in which there was more than ten points difference 47% of the 62% of differences were higher for Town B, leaving Town C only 15% of higher percentages.

Out of this 62% only 15% were between ten and twenty points of difference, leaving 47% over twenty. In this 47% the range of difference is anywhere from twenty points to seventy-one points showing a great disagreement in towns. These two towns have very different systems. Town B has arithmetic which shows up quite definitely in the last four questions as well as some of the others.

Tables twenty-nine and thirty show the result of two schools in the same town. We still find a wide variation in the percentage of right answers between the two. 50% of the answers show a variation of more than ten points. 24% out of this 50% were variations of between 10 and 20 points. The rest were over 20 points. This is different than the preceding table which showed few variations between

10 and 20 and more between 20 and 30. There are two variations in the fifties but the majority are in the twenties. School 2 showed off to better advantage than school 1 which was compared with Town B.

Out of the 15 higher variations 10 of them were on part one, of which four were on money.

All but one of the others were on number recognition and these ran pretty steady to twenty points difference. It may be that superior teaching is being done in the preliminary arithmetic of School 2.

Tables thirty-one and thirty-two show the returns of the two farming districts Towns D and E.

Instead of finding the percentages of right answers similar we find a very great variation. Over 66% of right answers show a variation of more than 10 points. 45% of this shows a variation of over 20 points. The variations run as high as 82 points in one place. Over half of the variations were in part one of the test.

In all except one instance (question 15) Town D was much superior to Town E. Town D has a group of very much better class children which may be the reason for this great difference. Also there were only 18 children from this town while there were 57 in the other

The writer thought that Table twenty-eight would be good to compare with Table thirty-three because again we have two similar adjoining towns.

This comparison still brings very great variations. However, the only place where the variations are better are where the comparisons were between two schools in the same town. 55% of the percentages of right answers of the two schools showed a variation of more than 10 points. Out of this 55%, 18% were of variations between ten and twenty. That leaves 37% of the percentages of right answers with a variation of over twenty. The variation runs as high as 68.

Town B has shown a much higher percentage of right answers. Out of the 55% of variations 40% of the higher answers are found in Town B. This town, in a previous analysis, proved superior.

In looking at the questions causing these great variations there seems a great possibility that it is due to teaching in the school, particularly the last four which are arithmetic examples. Then all these questions including numbers gave Town B the advantage.

Table XXVIII shows a summary for Grade One, Town B, in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	25	6	-	81%	19%	-
2	26	3	2	84%	10%	6%
3	25	5	1	81%	15%	3%
4	27	4	-	87%	13%	-
5	-	2	29	-	6%	94%
6	22	4	5	71%	13%	16%
7	21	1	9	68%	3%	29%
8	1	3	27	3%	10%	87%
9	19	2	10	62%	6%	32%
10	1	26	4	3%	84%	13%
11	22	6	3	71%	19%	10%
12	20	2	9	65%	6%	29%
13	20	2	9	65%	6%	29%
14	17	4	10	55%	13%	32%
15	29	2	-	94%	6%	-
16	29	1	1	94%	3%	3%
17	21	1	9	68%	3%	29%
18	31	-	-	100%	-	-
19	29	1	1	94%	3%	3%
20	31	-	-	100%	-	-
21	28	4	3	77%	13%	10%
22	24	4	3	77%	13%	10%
23	1	2	28	3%	6%	91%
24	20	7	4	65%	22%	13%
25	29	-	2	94%	-	6%
26	-	-	31	-	-	100%
27	1	1	29	3%	3%	94%
28	25	1	5	81%	3%	16%
29	29	1	1	94%	3%	3%
30	5	2	24	16%	6%	78%
31	21	10	-	68%	32%	-
32	26	5	-	84%	16%	-
33	29	1	1	94%	3%	3%
34	28	1	2	91%	3%	6%
35	27	2	2	88%	6%	5%
36	31	-	-	100%	-	-
37	31	-	-	100%	-	-
38	29	2	-	94%	6%	-
39	27	3	1	87%	10%	3%
40	24	5	2	78%	16%	6%

Table XXVIII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	27	1	3	87%	3%	10%
42	25	5	1	81%	16%	3%
43	26	3	2	84%	10%	6%
44	-	1	30	-	3%	97%
45	28	1	2	91%	3%	6%
46	31	-	-	100%	-	-
47	31	-	-	100%	-	-
48	30	1	-	97%	3%	-
49	31	-	-	100%	-	-
50	31	-	-	100%	-	-
51	30	-	1	97%	-	3%
52	31	-	-	100%	-	-
53	29	2	-	94%	6%	-
54	29	-	2	94%	-	6%
55	30	-	1	97%	-	3%
56	30	-	1	97%	-	6%
57	30	1	-	97%	3%	-
58	31	-	-	100%	-	-
59	31	-	-	100%	-	-
60	31	-	-	100%	-	-

Table XXIX shows a summary for Grade One, Town C, School 1 in terms of right answers, wrong answers and no response, with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No answer
1	21	18	1	54%	45%	3%
2	35	5	-	88%	12%	-
3	37	2	1	93%	5%	2½%
4	16	3	21	40%	8%	53%
5	16	2	22	40%	5%	55%
6	16	3	21	40%	8%	53%
7	14	3	23	35%	8%	57%
8	26	5	9	65%	12%	23%
9	23	2	15	58%	5%	37%
10	7	7	26	18%	18%	64%
11	7	1	32	18%	3%	80%
12	9	2	29	23%	5%	73%
13	16	1	23	40%	3%	57%
14	26	4	10	65%	10%	25%
15	33	4	3	82%	10%	8%
16	40	-	-	100%	-	-
17	38	2	-	95%	5%	-
18	38	1	1	95%	2½%	2½%
19	26	12	2	65%	30%	5%
20	36	4	-	90%	10%	-
21	8	8	24	20%	20%	60%
22	18	18	4	45%	45%	10%
23	8	4	28	20%	10%	70%
24	-	1	39	-	3%	97%
25	36	4	-	90%	10%	-
26	17	20	3	42%	50%	8%
27	15	10	15	38%	24%	38%
28	13	15	12	33%	38%	29%
29	13	14	13	33%	35%	33%
30	7	20	13	17%	50%	33%
31	27	13	-	67%	33%	-
32	35	5	-	88%	12%	-
33	38	1	1	95%	2½%	2½%
34	38	1	1	95%	2½%	2½%
35	31	9	-	77%	23%	-
36	37	3	-	93%	7%	-
37	32	8	-	80%	20%	-
38	31	8	1	77%	20%	3%
39	36	-	4	90%	-	10%
40	13	6	21	32%	15%	53%

Table XXIX, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	13	20	7	32%	50%	18%
42	13	2	25	32%	5%	63%
43	30	3	7	75%	8%	18%
44	-	4	36	-	10%	90%
45	16	3	21	40%	8%	52%
46	39	1	-	97%	3%	-
47	39	-	1	97%	-	3%
48	35	5	-	88%	12%	-
49	40	-	-	100%	-	-
50	39	-	1	97%	-	3%
51	39	-	1	97%	-	3%
52	39	1	-	97%	3%	-
53	35	5	-	88%	12%	-
54	23	15	2	58%	37%	5%
55	31	6	3	78%	15%	7%
56	35	3	2	88%	7%	5%
57	5	3	32	12%	7%	81%
58	-	1	39	-	3%	97%
59	8	1	31	20%	3%	78%
60	-	1	39	-	3%	97%

Table XXX shows a summary for Grade One, Town C, School Two in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	34	9	-	79%	21%	-
2	38	5	-	88%	12%	-
3	41	2	-	95%	5%	-
4	39	1	3	91%	2%	7%
5	-	-	43	-	-	100%
6	26	1	16	60%	3%	37%
7	2	7	34	5%	16%	79%
8	23	10	10	54%	23%	23%
9	38	4	1	88%	10%	4%
10	30	10	3	70%	23%	7%
11	2	-	41	5%	-	95%
12	19	5	19	44%	12%	44%
13	25	1	17	58%	3%	39%
14	35	4	4	81%	10%	10%
15	40	2	1	93%	5%	2%
16	42	1	-	98%	2%	-
17	41	2	-	95%	5%	-
18	41	-	2	95%	-	5%
19	34	8	2	79%	16%	5%
20	41	-	2	95%	-	5%
21	13	11	19	30%	26%	44%
22	10	32	1	23%	75%	2%
23	18	5	20	42%	11%	47%
24	5	3	35	11%	7%	82%
25	40	2	1	93%	4%	2%
26	18	24	1	42%	56%	2%
27	17	9	17	39½%	21%	39½%
28	20	5	18	47%	11%	42%
29	15	20	8	35%	47%	19%
30	19	11	13	44%	26%	30%
31	38	4	1	88%	10%	2%
32	35	8	-	81%	19%	-
33	42	1	-	98%	2%	-
34	37	5	1	86%	11%	2%
35	36	2	5	84%	5%	11%
36	42	-	1	98%	-	2%
37	40	2	1	93%	5%	2%
38	40	3	-	93%	7%	-
39	42	-	1	98%	-	2%
40	23	4	16	54%	10%	38%

Table XXX, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	25	16	2	58%	37%	5%
42	25	1	17	58%	2%	40%
43	33	4	6	77%	9%	14%
44	2	6	35	5%	14%	81%
45	31	2	10	72%	5%	23%
46	42	1	-	98%	2%	-
47	43	-	-	100%	-	-
48	41	2	-	95%	5%	-
49	43	-	-	100%	-	-
50	43	-	-	100%	-	-
51	43	-	-	100%	-	-
52	43	-	-	100%	-	-
53	41	2	-	95%	5%	-
54	23	17	3	53%	40%	7%
55	25	17	1	58%	40%	2%
56	39	4	-	91%	9%	-
57	10	1	32	23%	2%	74%
58	-	8	35	-	19%	81%
59	5	-	38	12%	-	88%
60	-	-	43	-	-	100%

Table XXXI shows a summary for Grade One, Town D, in terms of right answers, wrong answers and no responses with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	15	3	-	83%	17%	-
2	18	-	-	100%	-	-
3	15	3	-	83%	17%	-
4	17	1	-	94%	6%	-
5	-	-	18	-	-	100%
6	17	-	1	94%	-	5%
7	-	8	10	-	44%	56%
8	6	2	10	33%	11%	56%
9	15	-	3	83%	-	17%
10	12	2	4	67%	11%	22%
11	5	3	10	28%	17%	56%
12	-	9	9	-	50%	50%
13	14	1	3	78%	6%	17%
14	11	2	5	61%	11%	28%
15	13	2	3	72%	11%	17%
16	17	1	-	94%	6%	-
17	14	2	2	78%	11%	11%
18	18	-	-	100%	-	-
19	16	2	-	89%	11%	-
20	17	1	-	94%	6%	-
21	16	2	-	89%	11%	-
22	10	7	1	56%	39%	6%
23	4	-	14	22%	-	78%
24	8	7	3	44%	39%	17%
25	15	2	1	83%	11%	6%
26	11	7	-	61%	39%	-
27	14	2	2	78%	11%	11%
28	11	3	4	61%	17%	22%
29	9	8	1	50%	44%	6%
30	7	9	2	39%	50%	11%
31	16	1	1	89%	5½%	5½%
32	18	-	-	100%	-	-
33	18	-	-	100%	-	-
34	17	1	-	94%	6%	-
35	18	-	-	100%	-	-
36	18	-	-	100%	-	-
37	16	2	-	89%	11%	-
38	16	2	-	89%	11%	-
39	16	1	1	89%	5½%	5½%
40	13	5	-	72%	28%	-

Table XXXI, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	9	5	4	50%	28%	22%
42	11	6	1	61%	33%	6%
43	10	3	5	56%	17%	28%
44	-	3	15	-	17%	83%
45	10	2	6	56%	11%	33%
46	13	5	-	72%	28%	-
47	18	-	-	100%	-	-
48	16	2	-	89%	11%	-
49	18	-	-	100%	-	-
50	18	-	-	100%	-	-
51	18	-	-	100%	-	-
52	18	-	-	100%	-	-
53	18	-	-	100%	-	-
54	13	5	-	72%	28%	-
55	14	4	-	78%	22%	-
56	18	-	-	100%	-	-
57	6	8	4	33%	45%	22%
58	3	4	11	17%	22%	61%
59	-	-	18	-	-	100%
60	-	-	18	-	-	100%

Table XXXII shows a summary for Grade One, Town E, in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	37	19	1	65%	33%	2%
2	46	11	-	81%	19%	-
3	42	13	2	74%	22%	4%
4	44	12	1	77%	21%	2%
5	-	6	51	-	10%	90%
6	26	22	9	46%	39%	16%
7	6	23	28	10%	41%	50%
8	12	19	26	21%	33%	46%
9	10	11	36	18%	19%	63%
10	1	23	33	2%	40%	58%
11	5	4	48	9%	7%	84%
12	3	6	48	6%	11%	84%
13	7	8	42	12%	14%	74%
14	5	16	36	19%	29%	63%
15	53	4	-	93%	7%	-
16	53	3	1	93%	5%	2%
17	45	7	5	79%	12%	9%
18	56	-	1	98%	-	2%
19	16	16	25	28%	28%	44%
20	52	1	4	91%	2%	7%
21	4	36	17	7%	63%	30%
22	30	17	10	53%	30%	17%
23	6	25	26	11%	44%	46%
24	4	29	24	7%	51%	42%
25	36	7	14	63%	13%	24%
26	30	21	6	53%	37%	11%
27	24	4	39	25%	7%	69%
28	10	6	41	17%	11%	72%
29	6	11	40	11%	19%	17%
30	4	9	44	7%	16%	77%
# 31	36	18	2	64%	32%	4%
32	43	12	1	77%	21%	2%
33	46	3	7	81%	6%	13%
34	43	4	9	77%	7%	16%
35	45	8	3	80%	14%	6%
36	47	7	2	83%	13%	4%
37	35	17	4	63%	30%	7%
38	32	19	5	57%	34%	9%
39	46	3	7	82%	6%	12%
40	5	21	30	9%	38%	54%

# Total changes to 56

Table XXXII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	24	19	13	43%	34%	23%
42	11	16	29	20%	28%	52%
43	23	19	14	41%	34%	25%
44	-	29	27	-	52%	48%
45	8	12	36	14%	21%	64%
46	46	10	-	82%	18%	-
47	49	4	3	88%	7%	6%
48	48	6	2	86%	10%	4%
49	53	1	2	95%	2%	4%
50	53	1	2	95%	2%	4%
51	52	2	2	92%	4%	4%
52	52	2	2	92%	4%	4%
53	51	5	-	91%	9%	-
54	23	30	3	41%	54%	6%
55	31	23	2	55%	41%	4%
56	50	2	4	89%	4%	7%
57	-	24	32	-	43%	57%
58	-	24	32	-	43%	57%
59	-	24	32	-	43%	57%
60	-	24	32	-	43%	57%

Table XXXIII shows a summary for Grade One, Town F in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	26	3	-	90%	10%	-
2	27	2	-	93%	7%	-
3	27	2	-	93%	7%	-
4	28	1	-	96½%	3½%	-
5	8	2	19	28%	7%	65%
6	18	1	10	62%	4%	34%
7	-	2	27	-	7%	93%
8	11	7	11	38%	24%	38%
9	16	-	13	55%	-	45%
10	6	4	19	21%	14%	65%
11	17	1	11	59%	3%	38%
12	9	5	15	31%	17%	52%
13	23	1	5	79%	4%	17%
14	15	4	10	52%	14%	34%
15	24	3	2	83%	10%	7%
16	27	-	2	93%	-	7%
17	15	9	5	52%	31%	17%
18	27	1	1	93%	3½%	3½%
19	19	8	2	65%	28%	7%
20	28	1	-	97%	3%	-
21	8	7	14	28%	24%	48%
22	20	7	2	69%	24%	7%
23	12	8	9	41%	28%	31%
24	3	12	14	10%	41%	48%
25	27	2	-	93%	7%	-
26	25	4	-	86%	14%	-
27	14	12	3	48%	42%	10%
28	12	12	5	42%	42%	16%
29	7	17	5	24%	59%	16%
30	8	17	4	27%	59%	14%
31	22	7	-	76%	24%	-
32	22	7	-	76%	24%	-
33	26	3	-	90%	10%	-
34	21	7	1	72%	24%	4%
35	27	-	2	93%	-	7%
36	27	1	1	93%	3½%	3½%
37	23	4	2	79%	14%	7%
38	24	5	-	83%	17%	-
39	27	1	1	93%	3½%	3½%
40	16	8	5	55%	27%	17%

Table XXXIII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	17	6	6	59%	20½%	20½%
42	24	1	4	83%	4%	14%
43	19	5	5	65%	17½%	17½%
44	-	16	13	-	55%	45%
45	23	4	2	79%	14%	7%
46	23	4	2	79%	14%	7%
47	28	-	1	96%	-	4%
48	23	5	1	79%	17%	4%
49	26	-	3	90%	-	10%
50	26	2	1	90%	7%	4%

Tables Thirty-four through Thirty-nine show the totals of Grade 2 of each town and school.

Tables thirty-four and thirty-five are again from two similar adjoining towns. The towns being Towns B and C, School 1.

The percent of variations on the percentage of right answers is less than in Grade 1. There, it was 62% while here it is 47%. That is variations of more than ten points. Out of this 47% the variations from 10 to 20 points were 18% and more than 20 points 28%. The 18% is higher than Grade 1's 15% but the 28% is much lower than their 47%. The whole 18% goes to Town C for they did better in every single case than Town B. In the 28% the towns were more evenly divided with Town B getting 13% of the higher scores and Town C getting 15%.

In this last group Town B did better on part one and Town C did better on part two of the test in every single instance.

It is intersting to note that in Grade 1, Town B did much better than Town C, while in Grade 2, Town C was better. It would seem that Town B's training in Grade 1 was lost when it came to Grade 2.

Tables thirty-five and thirty-six show the returns of Grade 2 of two school in Town C in terms of totals and

and their percents.

There is only 32% of variation of more than ten points in these two schools which is much better than the 50% in Grade 1. Out of this 32%, 17% was for variations between ten and twenty as against 24% in Grade 1. That leaves 15% for variations beyond twenty as against 26% in Grade 1. This shows an improvement throughout for Grade 2.

The schools remained constant with School One in advance of School Two. Out of the 32% of variation Town One had 20% of the higher answers and 12% of them were in variations beyond twenty.

Aside from the last four questions in simple arithmetic where they got 100%, the variations were not concentrated on any special phase of the work.

Tables thirty-seven and thirty-eight show the returns of Grade 2 of the two schools in farming districts, Towns D and E in terms of totals and their percents.

Out of the sixty questions there was a variation of more than ten points between the two groups in 42% of the answers. This was much better than Grade 1 which showed a variation of over 66%. Out of this 42%, 27% were variations from between 10 and 20 points. The higher scores ran pretty evenly, Town D getting 12% and Town E 15% of the higher scores.

In the 15% of variation over 20 points Town E again had the higher scores in number right. Their percentage of higher scores was 12% as against 3% in Town D. These findings are in direct contrast to Grade 1 in these towns. In Grade 1, Town D was far in advance of Town E. The scores of questions causing higher variations were not concentrated around any certain section but were hit or miss throughout the questionaire.

Tables thirty-four and thirty-nine show the returns of Grade 2 of two schools in similar adjoining towns. They are Towns B and E. This group is in disagreement with the returns of the same group in Grade 1. Of course in the second grade five months means more in this type of test and Town E took the test five months later than Town B. This will easily explain the wide variation of 62% in over 10 points of variation on the percentage of right answers with 53% of the higher scores for Town E . 25% of the 62% were of variations between 10 and 20, while 37% were over 20 points. These variations were spread evenly through the questionaire with no emphasis on any particular group.

Table XXXIV shows a summary for Grade Two, Town B in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent Of No Answer
1	47	2	1	94%	4%	2%
2	46	3	1	92%	6%	2%
3	47	3	-	94%	6%	-
4	44	4	2	88%	8%	4%
5	32	17	1	64%	34%	2%
6	39	8	3	78%	16%	6%
7	17	32	1	34%	64%	2%
8	36	8	6	72%	16%	12%
9	43	7	-	86%	14%	-
10	40	8	2	80%	16%	4%
11	42	5	3	84%	10%	6%
12	36	14	-	72%	28%	-
13	43	6	1	86%	12%	2%
14	42	7	1	84%	14%	2%
15	50	-	-	100%	-	-
16	48	1	1	96%	2%	2%
17	41	7	2	82%	14%	4%
18	49	-	1	98%	-	2%
19	40	9	1	80%	18%	2%
20	48	2	-	96%	4%	-
21	36	12	2	72%	24%	4%
22	48	-	2	96%	-	4%
23	31	17	2	62%	34%	4%
24	23	24	3	46%	48%	6%
25	43	5	2	86%	10%	4%
26	38	12	-	76%	24%	-
27	39	10	1	78%	20%	2%
28	39	10	1	78%	20%	2%
29	26	23	1	52%	46%	2%
30	14	30	6	28%	60%	12%
31	44	6	-	88%	12%	-
32	47	3	-	94%	6%	-
33	36	7	7	72%	14%	14%
34	35	9	6	70%	18%	12%
35	47	1	2	94%	2%	4%
36	50	-	-	100%	-	-
37	43	7	-	86%	14%	-
38	42	8	-	84%	16%	-
39	41	5	4	82%	10%	8%
40	38	9	3	76%	18%	6%

Table XXXIV, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	32	15	3	64%	30%	6%
42	37	10	3	74%	20%	6%
43	31	17	2	62%	34%	4%
44	16	33	1	32%	66%	2%
45	38	10	2	76%	20%	4%
46	49	1	-	98%	2%	-
47	50	-	-	100%	-	-
48	37	3	-	94%	6%	-
49	50	-	-	100%	-	-
50	47	1	2	94%	2%	4%
51	49	-	1	98%	-	2%
52	49	-	1	98%	-	2%
53	47	1	2	94%	2%	4%
54	23	26	1	46%	52%	2%
55	33	17	-	66%	34%	-
56	40	5	5	80%	10%	10%
57	41	7	2	82%	14%	4%
58	24	25	1	48%	50%	2%
59	16	28	6	32%	56%	12%
60	16	28	6	32%	56%	12%

Table XXXV shows a summary of Grade Two, Town C, School 1 in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answers	Percent Right	Percent Wrong	Percent of No Answers
1	39	-	-	100%	-	-
2	38	1	-	98%	2%	-
3	37	2	-	95%	5%	-
4	39	-	-	100%	-	-
5	-	-	39	-	-	100%
6	35	-	4	90%	-	10%
7	11	-	28	28%	-	72%
8	30	-	9	77%	-	23%
9	37	-	2	95%	-	5%
10	37	2	-	95%	5%	-
11	-	39	-	-	100%	-
12	20	2	17	51%	5%	44%
13	32	-	7	82%	-	18%
14	36	1	2	93%	2%	5%
15	38	1	0	98%	2%	-
16	39	-	-	100%	-	-
17	36	3	-	93%	8%	-
18	39	-	-	100%	-	-
19	37	2	-	95%	5%	-
20	39	-	-	100%	-	-
21	24	8	7	62%	20%	18%
22	15	24	-	38%	62%	-
23	26	5	8	67%	13%	20%
24	10	6	23	26%	15%	59%
25	24	13	2	62%	33%	5%
26	28	11	-	72%	28%	-
27	21	7	11	54%	18%	28%
28	18	6	15	46%	15%	39%
29	19	9	11	49%	23%	28%
30	17	8	14	44%	20%	36%
31	36	3	-	93%	7%	-
32	38	1	-	98%	2%	-
33	39	-	-	100%	-	-
34	39	-	-	100%	-	-
35	38	-	1	98%	-	2%
36	39	-	-	100%	-	-
37	34	5	-	87%	13%	-
38	35	4	-	90%	10%	-
39	38	-	2	95%	-	5%
40	36	2	1	93%	5%	2%

Table XXXV, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	31	7	1	79%	18%	2%
42	37	-	2	95%	-	5%
43	36	2	1	93%	5%	2%
44	10	14	15	24%	36%	39%
45	35	2	2	90%	5%	5%
46	39	-	-	100%	-	-
47	38	-	1	98%	-	2%
48	38	1	-	98%	2%	-
49	38	-	1	98%	-	2%
50	39	-	-	100%	-	-
51	39	-	-	100%	-	-
52	30	-	-	100%	-	-
53	37	2	-	95%	5%	-
54	31	8	-	79%	21%	-
55	35	4	-	90%	10%	-
56	38	1	-	98%	2%	-
57	38	1	-	98%	2%	-
58	38	1	-	98%	2%	-
59	39	-	-	100%	-	-
60	39	-	-	100%	-	-

Table XXXVI shows a summary for Grade Two, Town C, School 2 in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answers	Percent Right	Percent Wrong	Percent of No Answers
1	63	8	1	78%	11%	1%
2	68	4	-	95%	5%	-
3	69	3	-	96%	4%	-
4	69	3	-	96%	4%	-
5	-	72	-	-	100%	-
6	67	2	3	93%	3%	4%
7	6	3	63	8%	4%	88%
8	51	14	7	71%	19%	10%
9	61	5	6	85%	7%	8%
10	61	8	3	85%	11%	4%
11	-	72	-	-	100%	-
12	37	6	29	52%	8%	40%
13	60	1	11	83%	2%	15%
14	61	2	9	85%	3%	12%
15	69	2	2	95%	2½%	2½%
16	67	1	4	93%	1½%	5½%
17	69	3	-	96%	4%	-
18	70	1	1	97%	1½%	1½%
19	59	10	3	82%	14%	3%
20	69	1	2	96%	2½%	1½%
21	38	19	15	53%	26%	21%
22	45	27	-	63%	37%	-
23	44	9	19	61%	13%	26%
24	22	14	36	30%	20%	50%
25	69	3	-	96%	4%	-
26	43	26	3	60%	36%	4%
27	51	11	10	71%	15%	14%
28	43	14	15	60%	19%	21%
29	43	19	10	60%	27%	13%
30	40	17	15	56%	23%	21%
31	60	4	8	83%	6%	11%
32	60	4	8	93%	6%	11%
33	64	-	8	89%	-	11%
34	65	1	6	90%	2%	8%
35	68	3	1	94%	4%	2%
36	72	-	-	100%	-	-
37	71	1	-	98%	2%	-
38	72	-	-	100%	-	-
39	69	1	2	96%	1½%	2½%
40	63	6	3	88%	8%	4%

Table XXXVI, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	56	15	1	78%	20%	2%
42	62	4	6	86%	6%	8%
43	62	10	2	86%	13%	1½%
44	6	39	27	8%	54%	37%
45	65	2	5	90%	3%	7%
46	72	-	-	100%	-	-
47	71	-	1	98½%	-	1½%
48	71	1	-	98½%	1½%	-
49	72	-	-	100%	-	-
50	71	1	-	98½%	1½%	-
51	72	-	-	100%	-	-
52	72	-	-	100%	-	-
53	66	6	-	92%	8%	-
54	44	28	-	61%	39%	-
55	43	26	3	60%	36%	4%
56	71	1	-	98½%	1½%	-
57	51	3	18	71%	4%	25%
58	37	12	23	51%	17%	32%
59	45	5	22	62%	7%	31%
60	30	3	39	42%	4%	54%

Table XXXVII shows a summary for Grade Two, Town D in terms of right answers, wrong answers and no response and their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	18	4	1	78%	17%	4%
2	21	2	-	91%	9%	-
3	23	-	-	100%	-	-
4	21	2	-	91%	9%	-
5	20	3	-	87%	13%	-
6	20	2	1	87%	9%	4%
7	7	9	7	30%	40%	30%
8	15	5	3	65%	22%	13%
9	19	3	1	83%	13%	4%
10	19	3	1	83%	13%	4%
11	11	8	4	48%	35%	17%
12	12	9	2	52%	39%	9%
13	12	11	-	52%	48%	-
14	16	7	-	70%	30%	-
15	22	1	-	96%	4%	-
16	21	1	1	91%	4½%	4½%
17	20	2	1	87%	9%	4%
18	22	-	1	96%	-	4%
19	19	4	-	83%	17%	-
20	23	-	-	100%	-	-
21	20	3	-	87%	13%	-
22	16	7	-	70%	30%	-
23	15	4	4	65%	17%	17%
24	13	9	1	56%	40%	4%
25	21	2	-	91%	9%	-
26	10	13	-	43%	57%	-
27	14	9	-	60%	40%	-
28	15	8	-	65%	35%	-
29	16	5	2	79%	22%	-
30	10	11	2	43%	48%	9%
31	18	3	2	78%	13%	9%
32	23	-	-	100%	-	-
33	21	1	1	91%	4½%	4½%
34	19	2	2	83%	8½%	8½%
35	20	2	1	87%	9%	4%
36	22	1	-	96%	4%	-
37	23	-	-	100%	-	-
37	23	-	-	100%	-	-
39	22	-	1	96%	-	4%
40	21	2	-	91%	9%	-

Table XXXVII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	18	5	-	78%	22%	-
42	19	4	-	83%	17%	-
43	22	-	1	96%	-	4%
44	11	10	2	48%	43%	9%
45	21	1	1	91%	4½%	4½%
46	23	-	-	100%	-	-
47	23	-	-	100%	-	-
48	21	2	-	91%	9%	-
49	22	-	1	96%	-	4%
50	22	-	1	96%	-	4%
51	22	-	1	96%	-	4%
52	23	-	-	100%	-	-
53	23	-	-	100%	-	-
54	18	5	-	78%	22%	-
55	19	4	-	83%	17%	-
56	22	1	-	96%	4%	-
57	19	4	-	83%	17%	-
58	14	7	2	61%	30%	9%
59	14	7	2	61%	30%	9%
60	14	7	2	61%	30%	9%

Table XXXVIII shows a summary of Grade Two, Town E in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	45	5	1	88%	10%	2%
2	51	-	-	100%	-	-
3	51	-	-	100%	-	-
4	47	3	1	92%	6%	2%
5	34	15	2	67%	29%	4%
6	42	6	3	82%	12%	6%
7	24	26	1	47%	51%	2%
8	46	4	1	90%	8%	2%
9	47	4	-	92%	8%	-
10	21	28	2	41%	55%	4%
11	28	20	3	55%	39%	6%
12	33	16	2	65%	31%	4%
13	43	6	2	84%	12%	4%
14	45	5	1	88%	10%	2%
15	45	6	-	88%	12%	-
16	43	5	3	84%	10%	6%
17	43	7	1	84%	14%	2%
18	49	-	2	96%	-	4%
19	37	13	1	73%	25%	2%
20	49	-	2	96%	-	4%
21	38	11	2	75%	22%	4%
22	29	18	4	57%	35%	8%
23	35	15	1	68%	30%	2%
24	26	24	1	51%	47%	2%
25	45	5	1	88%	10%	2%
26	34	16	1	67%	31%	2%
27	49	2	-	96%	4%	-
28	48	2	1	94%	4%	2%
29	31	20	-	61%	39%	-
30	42	6	3	82%	12%	6%
31	48	2	1	94%	4%	2%
32	48	2	1	94%	4%	2%
33	49	1	1	96%	2%	2%
34	50	1	-	98%	2%	-
35	50	1	-	98%	2%	-
36	50	1	-	98%	2%	-
37	47	3	1	92%	6%	2%
38	47	3	1	92%	6%	2%
39	47	1	3	92%	2%	6%
40	44	4	3	86%	8%	6%

Table XXXVIII, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	43	5	3	84%	10%	6%
42	43	6	2	84%	12%	4%
43	40	10	1	79%	20%	2%
44	21	29	1	41%	57%	2%
45	49	1	1	96%	2%	2%
46	46	2	-	96%	4%	-
47	49	2	-	96%	4%	-
48	39	12	-	77%	23%	-
49	51	-	-	100%	-	-
50	51	-	-	100%	-	-
51	50	-	1	98%	-	2%
52	51	-	-	100%	-	-
53	50	1	-	98%	2%	-
54	37	14	-	73%	27%	-
55	33	17	1	65%	33%	2%
56	39	1	1	96%	2%	2%
57	45	4	2	78%	8%	4%
58	43	5	3	84%	10%	6%
59	38	9	4	75%	17%	8%
60	33	9	9	66%	17%	17%

Table XXXIX shows a summary for Grade Two, Town F in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	25	-	-	100%	-	-
2	25	-	-	100%	-	-
3	25	-	-	100%	-	-
4	24	-	1	96%	-	4%
5	23	1	1	92%	4%	4%
6	24	1	-	96%	4%	-
7	23	2	-	92%	8%	-
8	21	4	-	84%	16%	-
9	25	-	-	100%	-	-
10	23	2	-	92%	8%	-
11	21	2	2	84%	8%	8%
12	23	2	-	92%	8%	-
13	25	-	-	100%	-	-
14	24	-	1	96%	-	4%
15	24	-	1	96%	-	4%
16	25	-	-	100%	-	-
17	17	5	3	68%	20%	12%
18	25	-	-	100%	-	-
19	16	8	1	64%	32%	4%
20	25	-	-	100%	-	-
21	24	1	-	96%	4%	-
22	15	9	1	60%	36%	4%
23	24	1	-	96%	4%	-
24	24	1	-	96%	4%	-
25	23	2	-	92%	8%	-
26	13	12	-	52%	48%	-
27	24	1	-	96%	4%	-
28	23	1	1	92%	4%	4%
29	21	3	1	84%	12%	4%
30	21	2	2	84%	8%	8%
31	24	1	-	96%	4%	-
32	23	2	-	92%	8%	-
33	25	-	-	100%	-	-
34	24	-	1	96%	-	4%
35	24	-	1	96%	-	4%
36	25	-	-	100%	-	-
37	24	1	-	96%	4%	-
38	23	2	-	92%	8%	-
39	25	-	-	100%	-	-
40	22	3	-	88%	12%	-

Table XXXIX, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	21	3	1	84%	12%	4%
42	25	-	-	100%	-	-
43	22	3	-	88%	12%	-
44	15	10	-	60%	40%	-
45	25	-	-	100%	-	-
46	25	-	-	100%	-	-
47	25	-	-	100%	-	-
48	21	4	-	84%	16%	-
49	25	-	-	100%	-	-
40	25	-	-	100%	-	-
51	25	-	-	100%	-	-
52	23	1	1	92%	4%	4%
53	24	1	-	96%	4%	-
54	21	3	1	84%	12%	4%
55	23	2	-	92%	8%	-
56	24	1	-	96%	4%	-
57	25	-	-	100%	-	-
58	23	1	1	92%	4%	4%
59	24	-	1	96%	-	4%
60	24	-	1	96%	-	4%

Tables forty, forty-one and forty-two show the total returns of kindergarten, first grade and second grade.

It will be easier and less complicated to deal with these tables. Instead of looking for greater variations the less variations will be more interesting.

It is found in the kindergarten and Grade 1 that there is only 22% of the percentages of right answers with a variation of less than ten. In a few cases the percentage of right answers is higher for the kindergarten, about 8%.

The questions on which the kindergarten got the higher percents were: recognizing the largest block (18), all the kindergarten could do it while only 97% of Grade 1 could do it, both milk questions (25 and 26) on which the kindergarten received 95% and 47½% as against 84% and 46% for Grade 1. 24% of the kindergarten knew what time to go to school while only 23% of the first grade knew it.

Then in question 46, on recognizing the most parts in a pumpkin, all of the kindergarten could do it while only 89% of the first grade could do it.

The questions at which the kindergarten excelled seemed to do with a kindergarten curriculum to some extent and mayhaps they were more conscious of the right

answer at the time.

Taking tables forty-one and forty-two, showing total results for Grades 1 and 2, and treating them the same way it is found that 37% of the percentage of right answers has a variation of less than ten points. In only two instances does the first grade exceed the second in percentage of right answers. These questions are, recognizing a circle (16) and writing four numbers (37). The first grade's percents on right answers were 95% and 92% as against 93% and 90% for Grade 2.

In one instance both groups had 97% on the right answers. This question was on recognizing the largest square (18). The kindergarten received 100% in right answers on this question which was higher than either grade.

In all instances in all these tables where the percentage of right answers, as between grades, had a variation of more than ten points the higher grade received the higher percent of right answers.

A more extensive analysis of these three tables is given in the conclusions. These three tables are well pictured as to right answers in Graph 1 and 2.

Graph 1 shows the percentages of right answers by questions with the different grades side by side represented by differet colored crayons.

Graph 2 shows the percents of right answers by grades in a descending scale.

Table XL shows a summary for the kindergarten children in terms of right answers, wrong answers and no responses with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	11	8	2	52%	38%	10%
2	12	9	-	57%	43%	-
3	12	9	-	57%	43%	-
4	16	2	3	76%	10%	14%
5	-	-	21	-	-	100%
6	3	15	3	14%	72%	14%
7	-	16	5	-	76%	24%
8	5	4	12	24%	19%	37%
9	6	12	3	28%	57%	14%
10	2	8	11	10%	38%	52%
11	3	6	12	14%	29%	57%
12	-	9	12	-	43%	57%
13	1	8	12	5%	38%	57%
14	4	9	8	19%	43%	38%
15	14	6	1	67%	28%	5%
16	18	2	1	86%	10%	5%
17	18	3	-	86%	14%	-
18	21	-	-	100%	-	-
19	5	15	1	24%	71%	5%
20	19	2	-	90%	10%	-
21	4	9	8	19%	43%	38%
22	6	15	-	29%	71%	-
23	4	7	10	19%	33%	48%
24	2	12	7	10%	57%	33%
25	20	1	-	95%	5%	-
26	10	10	1	47½%	47½%	5%
27	4	4	13	19%	19%	62%
28	4	5	12	19%	24%	57%
29	2	5	14	10%	24%	67%
30	5	4	12	24%	19%	57%
31	4	17	-	19%	81%	-
32	11	10	-	52%	48%	-
33	16	4	1	76%	19%	5%
34	10	10	1	47½%	47½%	5%
35	10	8	3	48%	38%	14%
36	17	3	1	81%	14%	5%
37	3	6	12	14%	29%	57%
38	3	5	13	14%	24%	62%
39	3	12	6	14%	57%	29%
40	5	2	14	24%	10%	67%

Table XL, cont.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	6	6	9	28½%	28½%	43%
42	-	4	17	-	19%	81%
43	3	1	17	14%	5%	81%
44	-	3	18	-	14%	86%
45	-	1	20	-	5%	95%
46	21	-	-	100%	-	-
47	20	1	-	95%	5%	-
48	16	4	1	76%	19%	5%
49	19	-	2	90%	-	10%
50	20	1	-	95%	5%	-
51	18	3	-	86%	14%	-
52	17	2	2	81%	9½%	9½%
53	16	5	-	76%	24%	-
54	7	14	-	33%	67%	-
55	4	17	-	19%	81%	-
56	12	9	-	57%	43%	-
57	1	4	16	5%	19%	76%
58	-	4	17	-	19%	81%
59	-	4	17	-	19%	81%
60	-	2	19	-	10%	90%

Table XLI shows a summary for all Grades One in terms of right answers, wrong answers and no response with their respective percents.

Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	158	58	2	72%	27%	1%
2	190	26	2	87%	12%	1%
3	187	27	4	86%	12%	2%
4	171	22	25	78%	10%	11%
5	24	182	12	11%	84%	5%
6	125	31	62	57%	14%	28%
7	43	44	131	19%	20%	60%
8	79	46	93	36%	21%	43%
9	121	19	78	55%	9%	46%
10	57	72	89	25%	33%	41%
11	58	15	145	27%	6%	67%
12	60	29	129	28%	13%	59%
13	105	14	99	48%	6%	46%
14	109	34	75	50%	16%	34%
15	192	17	9	88%	8%	4%
16	208	6	4	95%	3%	2%
17	174	23	21	80%	10%	10%
18	211	2	5	97%	1%	2%
19	140	46	32	64%	21%	15%
20	205	7	6	94%	3%	3%
21	77	60	81	35%	28%	37%
22	112	85	21	51%	39%	10%
23	49	44	125	22%	20%	58%
24	40	59	119	18%	27%	55%
25	183	17	18	84%	8%	8%
26	101	76	41	46%	35%	19%
27	75	38	105	34%	18%	48%
28	91	42	85	42%	19%	39%
29	79	71	68	36%	33%	31%
30	50	68	100	23%	31%	46%
# 31	160	53	4	74%	24%	2%
32	179	37	1	82½%	17%	½%
33	199	9	9	92%	4%	4%
34	184	19	14	85%	9%	6%
35	184	21	12	85%	10%	6%
36	202	11	4	93%	5%	2%
37	177	33	7	82%	15%	3%
38	172	39	6	79%	18%	3%
39	194	8	15	89%	4%	7%
40	94	49	74	43%	23%	34%

# Total changes to 217

Table XLI, cont.

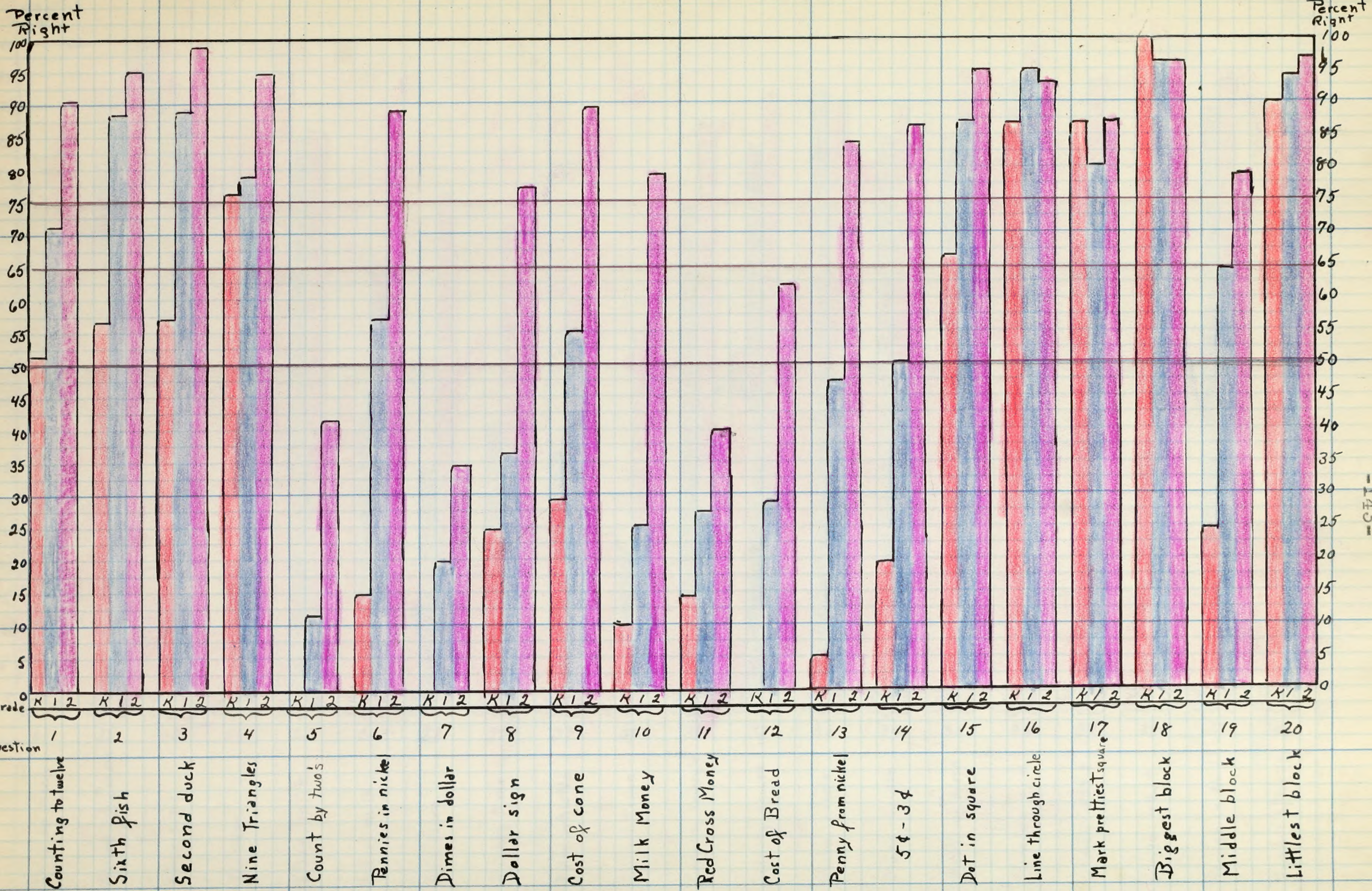
Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	115	67	35	53%	31%	16%
42	109	31	77	50%	14%	35%
43	141	37	39	65%	17%	18%
44	3	59	156	1%	27%	72%
45	116	24	77	53%	12%	35%
46	194	21	2	89%	10%	1%
47	208	4	5	96%	2%	2%
48	193	21	3	89%	10%	1%
49	211	1	5	97%	½%	2½%
50	210	3	4	97%	2%	1%
51	210	2	5	97%	1%	2%
52	210	4	3	97%	2%	1%
53	201	16	-	93%	7%	-
54	132	75	10	60%	35%	5%
55	154	56	7	71%	36%	3%
56	200	10	7	92%	5%	3%
57	69	44	104	32%	20%	48%
58	45	47	125	21%	21%	58%
59	60	34	123	28%	16%	57%
60	41	37	139	19%	17%	64%

Table XLII shows a summary for all Grades Two in terms of right answers, wrong answers and no responses with their respective percents.

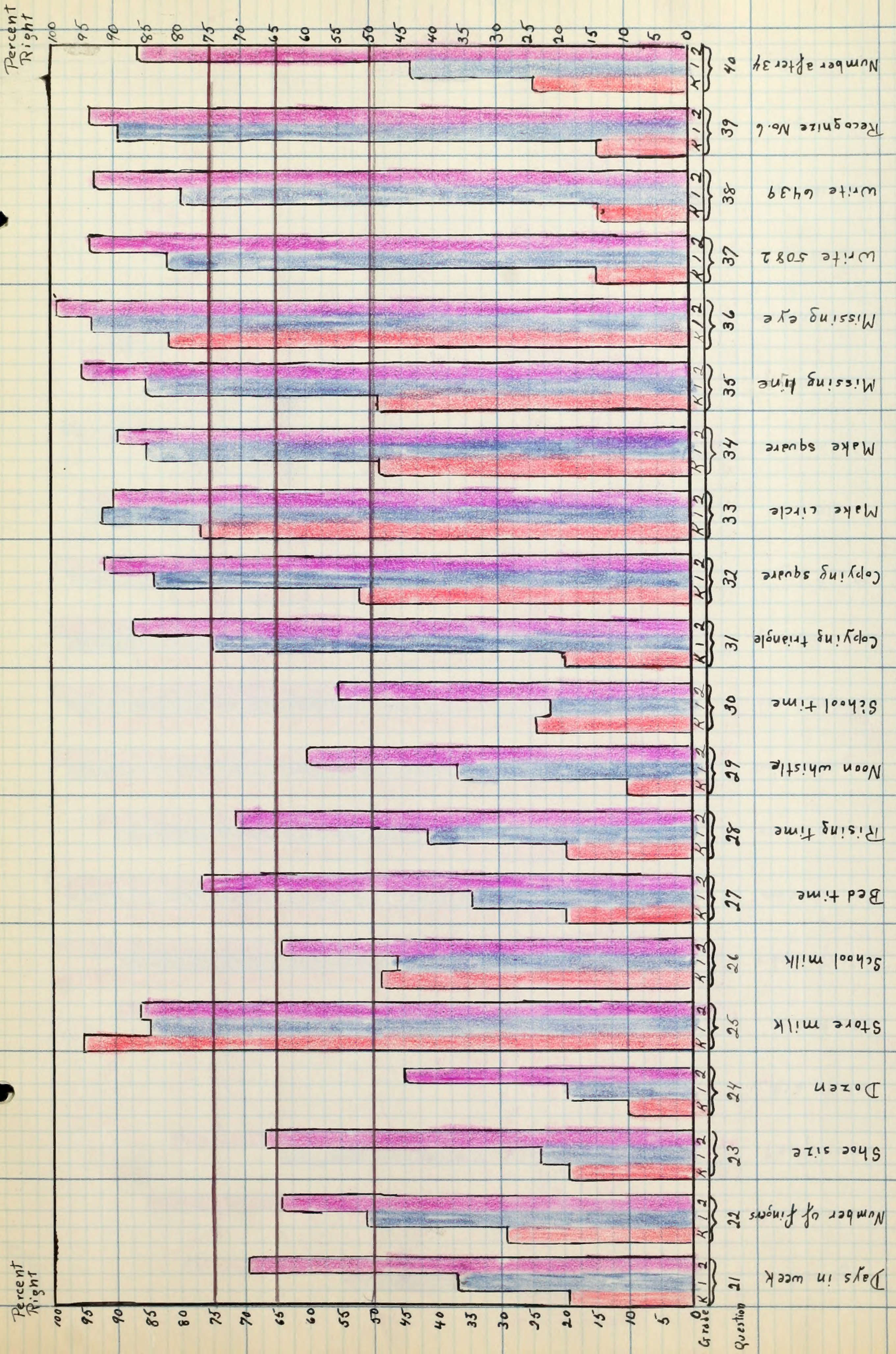
Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
1	237	19	4	91%	7%	2%
2	249	10	1	95½%	4%	½%
3	252	8	-	97%	3%	-
4	244	12	4	94%	4½%	1½%
5	109	36	115	42%	14%	44%
6	227	19	14	87%	7½%	5½%
7	88	72	100	34%	28%	38%
8	199	35	26	77%	13%	10%
9	232	19	9	89%	7%	3%
10	201	51	8	78%	20%	3%
11	102	35	123	39%	13%	47%
12	161	49	50	62%	19%	18%
13	215	24	21	83%	9%	8%
14	224	22	14	86%	8%	5%
15	247	10	3	95%	4%	1%
16	243	8	9	93%	3½%	3½%
17	226	27	7	87%	10%	3%
18	254	1	5	97%	½%	2½%
19	208	46	6	79%	18%	3%
20	253	3	4	97%	2%	2%
21	180	54	26	69%	21%	10%
22	168	85	7	64%	33%	3%
23	175	51	34	67%	19%	13%
24	118	78	64	45%	30%	25%
25	225	30	5	86%	12%	2%
26	166	90	4	65%	34%	2%
27	198	40	22	76%	15%	8%
28	186	41	33	71%	16%	13%
29	156	79	25	60%	30%	10%
30	144	74	42	55%	28%	16%
31	230	19	11	88%	7%	4%
32	239	12	9	91%	5%	3%
33	234	9	17	90%	3%	7%
34	232	13	15	89%	5%	6%
35	247	7	6	95%	3%	2%
36	258	2	-	99%	1%	-
37	242	17	1	93%	5½%	½%
38	242	17	1	93%	6½%	½%
39	241	7	12	93%	3%	5%
40	224	26	10	86%	10%	3%

Table XLII, cont.

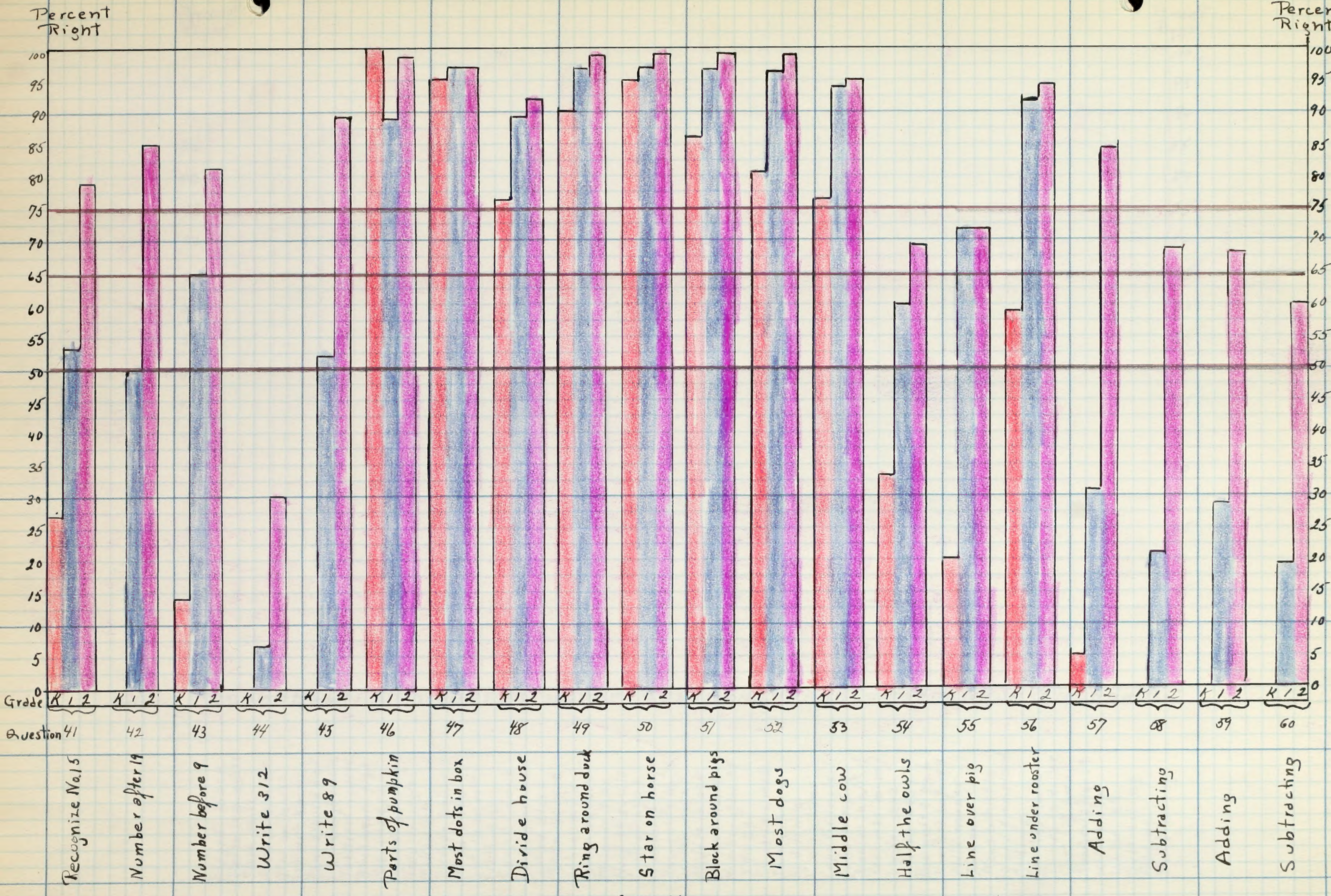
Question	Number Right	Number Wrong	Number of No Answer	Percent Right	Percent Wrong	Percent of No Answer
41	201	50	9	78%	19%	3%
42	223	24	13	85%	10%	5%
43	211	42	7	81%	16%	3%
44	79	135	46	30%	52%	18%
45	233	16	11	89%	6%	4%
46	257	3	-	98%	2%	-
47	256	2	2	97%	1½%	1½%
48	237	23	-	91%	9%	-
49	258	-	2	99%	-	1%
50	255	2	3	98%	1%	1%
51	257	-	3	99%	-	1%
52	257	1	2	99%	½%	½%
53	247	11	2	95%	4%	1%
54	174	84	2	67%	32%	1%
55	186	70	4	72%	26%	2%
56	244	10	6	94%	4%	2%
57	218	19	22	84%	7%	8%
58	179	51	30	69%	20%	11%
59	176	49	35	68%	19%	13%
60	156	47	57	60%	18%	22%



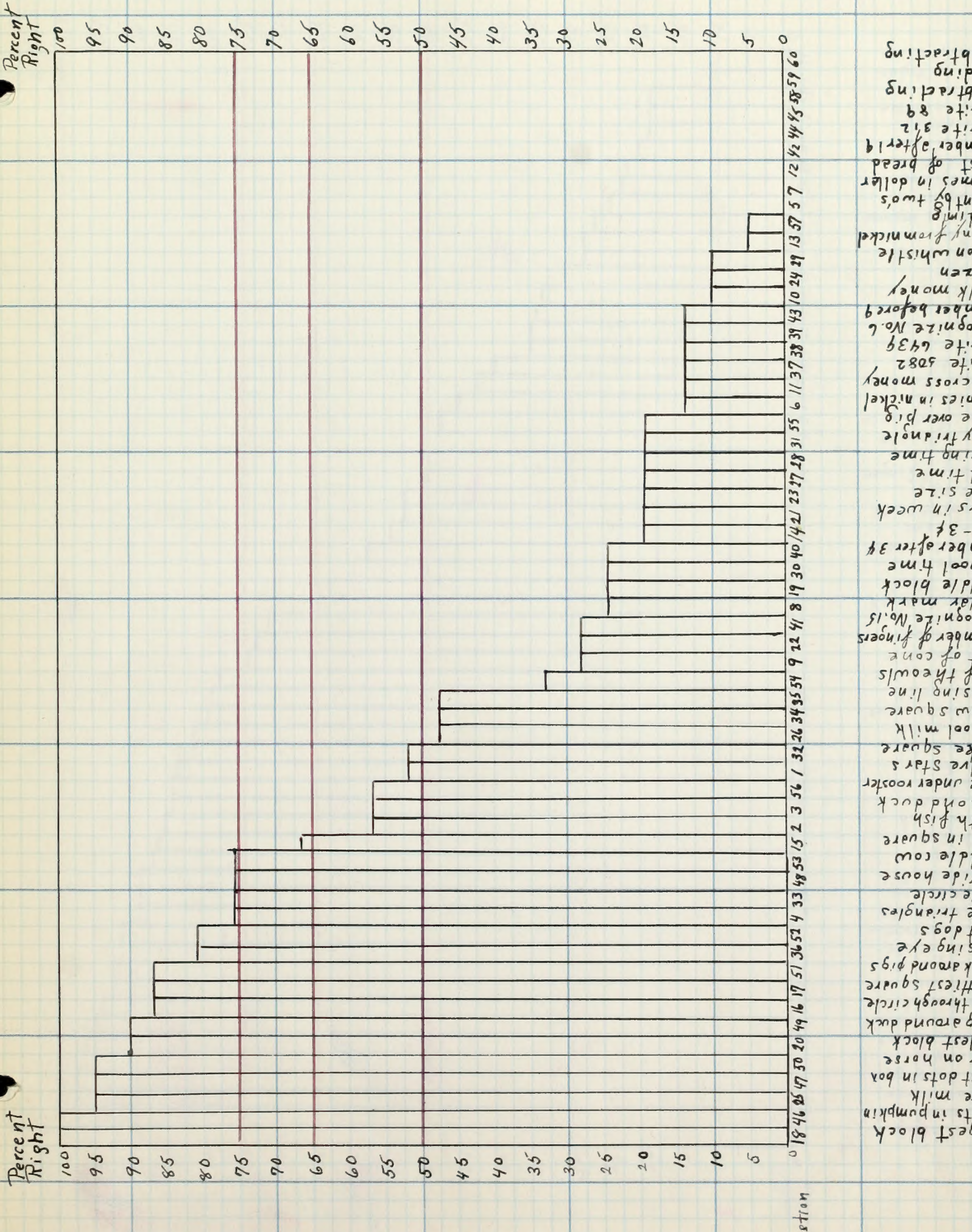
GRAPH I showing percentages of right answers by grades on the sixty questions of the Arithmetic Readiness Test


Percent Right
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
Grade
Question
K 1 2
21 Days in week
22 Number of fingers
23 Shoe size
24 Dozen
25 Store milk
26 School milk
27 Bed time
28 Rising time
29 Noon whistle
30 School time
31 Copying triangle
32 Copying square
33 Make circle
34 Make square
35 Missing line
36 Missing eye
37 Write 5082
38 Write 6439
39 Recognize No. 6
40 Number after 34

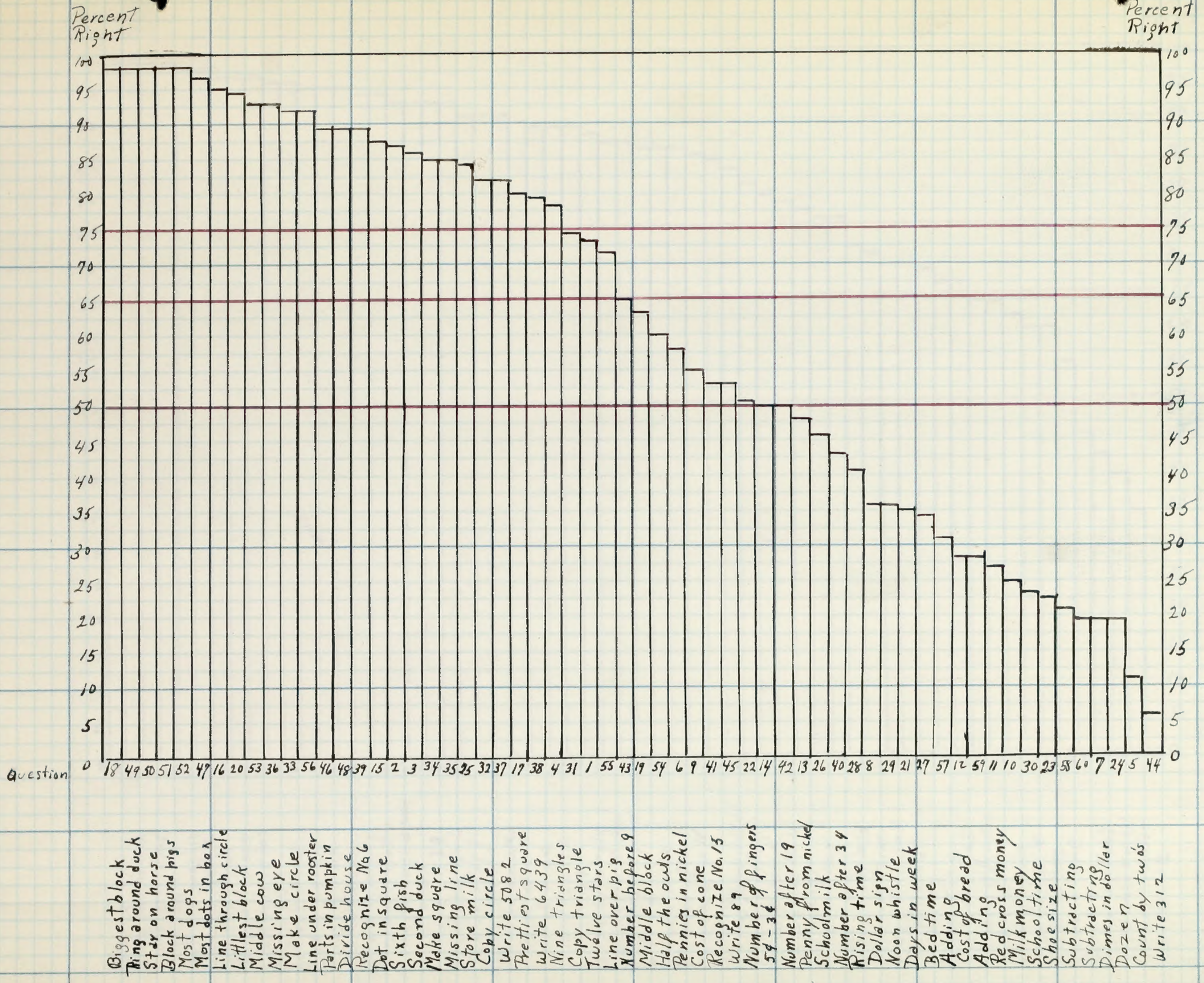
GRAPH I cont.



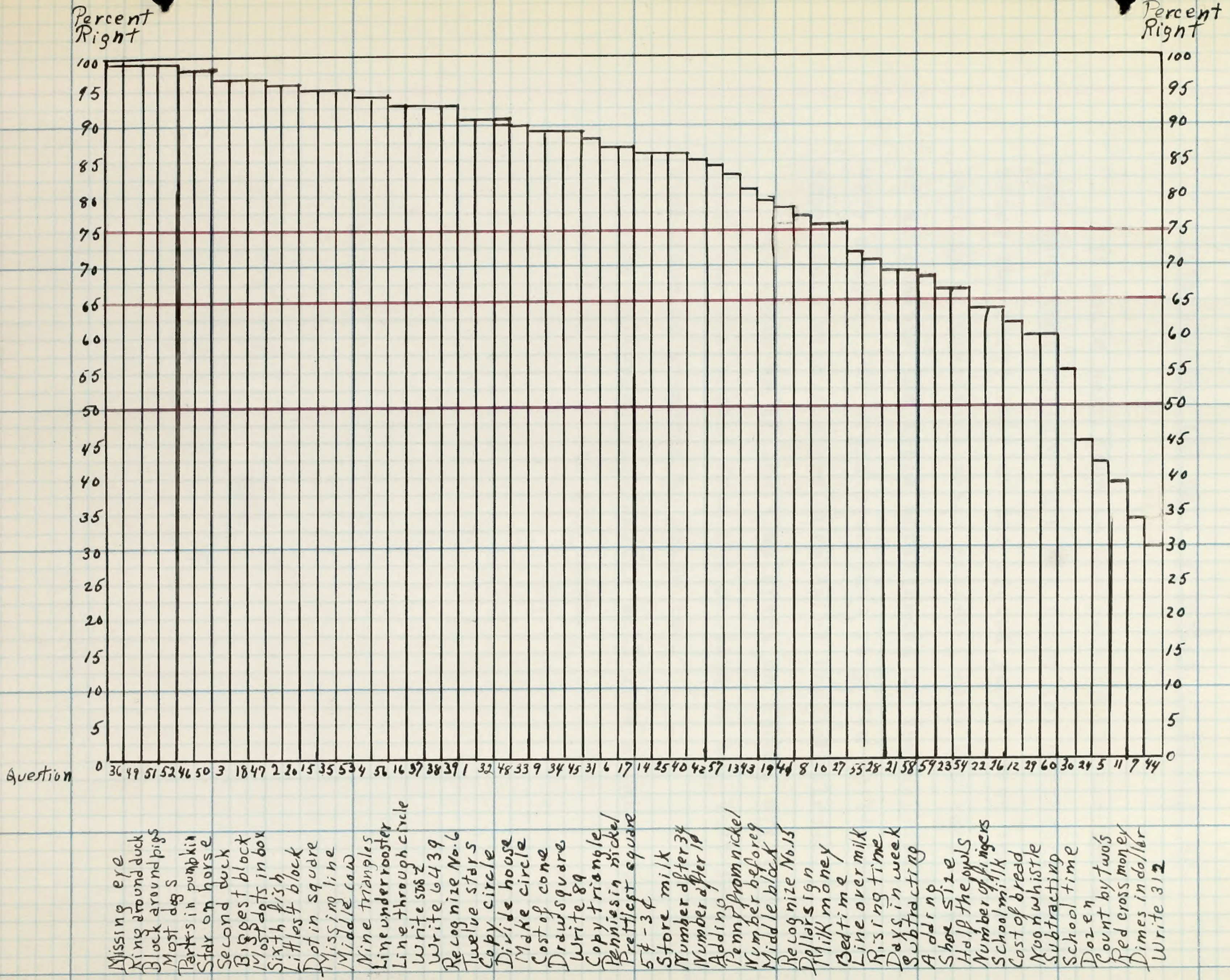
GRAPH I concluded.



GRAPH II A descending scale showing percentages of right answers on the Arithmetic Readiness Test in the kindergarten



GRAPH III A descending scale showing percentages of right answers on the Arithmetic Readiness Test in Grade I



GRAPH IV A descending scale showing percentages of right answers on the Arithmetic Readiness Test in Grade II

Interpreting the data of Tables 41 through 42.

It would seem from an analysis of the results of the test that children are not ready for arithmetic until after the first half of the second year. From the large variety of questions asked covering many and varied types of arithmetic the types experienced by the children were very meager. It would seem that very few children have experience with numbers outside of the schoolroom.

It looks as if the time spent on formal drill in grade one was wasted from the results of the last four questions as answered by grade two.

The following conclusions will give a basis for arithmetical interests and units.

CHAPTER IV
GENERAL CONCLUSIONS

Drawing conclusions from data is not a simple matter. How shall a basis for conclusions be established? What percentage of the pupils must show intelligent response to a question before we can conclude that the situation covered by the question has been a part of the child's experience? There is no adequate basis for deciding this point. MacLatchy takes a favorable attitude toward correct responses using from 50% (apparently) to 90%.[1]

In the present study a 75% correct response by children, has been taken as the dividing line. Drawing this line in illustration shows the items that extend above the lines, viz., items in Graph I.

However, in this same illustration, a line is also drawn at the 65% level and another at 50%. Only careful study and experimentation can determine where the line should be drawn.

The group on counting. Questions 1-6. There seems to be quite a dividing line here. 52% of the kindergarten children were unable to count to twelve, question one, and 57% couldn't distinguish sixth and second, but 76% were able to count to nine. 72% of the first grade children had difficulty in counting to twelve but 90% were able to count to nine. 78% of the second grade children had no difficulty in counting by one's. Counting by two's seemed to be beyond all the

---

[1] Buckingham, B.R. & MacLatchy, Josephine Number Abilities of Children when they enter Grade I. 29th Yearbook of Nat. Society for the Study of Education. p. 473-524

children. The reason the second grade (41%) did so well on that is found in the places where the children have been taught in school to count by two's. This is not an experience situation but a learned school situation. A re-testing five months later on this question showed a far smaller percentage of children able to do this. This shows that there was no use for it outside of the school room.

Group on money. Questions 6-15. It was quite surprising that the children were unable to answer the question of pennies in a nickel. Children always have pennies but the association is lacking in all but the second grade, whose percentage of correct answers was 87. Only 19% of grade one and 3% of grade two children knew the number of dimes in a dollar. This question would be utterly disregarded. Only 76% of second grade children recognized the dollar sign. In this question the first grade (36%) and kindergarten (24%) were about the same but the second grade made a tremendous jump. Possibly they had come in contact with it in the school room or in their toy grocery store.

An ice cream cone is very common but still the price is unknown to most children except in the second grade (89%). In thinking over this question the difficulty may be in answering the question. Quite possibly the children knew that it was a nickel but were unable to write nickel. The sixth question shows that the children didn't know how many pennies

there are in a nickel so they probably didn't know they could write a five there.

The milk question shows a very wide range. The kindergarten (10%) and first grade (25%) know practically nothing about the amount of money they bring but 78% of the second grade do. The children in the second grade upon being questioned will tell you now much it is, how much they have and what change they should receive. In correcting this question it was recognized that the price in each town might have been different. In some schools the price was 20¢, in another 25¢ and in still another they brought a nickel when they could. Thus the answer was right or wrong according to the price of milk in the town in which the child lived.

The Red Cross money question is useless. It was found that many children brought no money or didn't know how much they had brought. Even in grade two the percentage correct went up to only 39.

The bread question seems useless, too. It is surprising the number of children that do go to the store for mother for bread and the few children that know the cost (only 62% of second grade). This may be due to the fact that the food is charged or other articles bought at the same time, or a couple of empty milk bottles are taken in exchange for the bread.

there are in a nickel so they probably didn't know they could write a five there.

The milk question shows a very wide range. The kindergarten (10%) and first grade (23%) know practically nothing about the amount of money they bring but 78% of the second grade do. The children in the second grade upon being questioned will tell you how much it is, how much they have and what change they should receive. In correcting this question it was recognized that the price in each town might have been different. In some schools the price was 20¢, in another 25¢ and in still another they brought a nickel when they could. Thus the answer was right or wrong according to the price of milk in the town in which the child lived.

The Red Cross money question is useless. It was found that many children brought no money or didn't know how much they had brought. Even in grade two the percentage correct went up to 39.

The bread question seems useless, too. It is surprising the number of children that do go to the store for mother for bread and the few children that know the cost (only 63% of second grade). This may be due to the fact that the food is charged or other articles bought at the same time, or a couple of empty milk bottles are taken in exchange for the bread.

The questions on spending money were purposely arranged to be similar. Although the kindergarten and first grade were both very low, both groups did better when five cents was used instead of nickel. The second grade did very well anyway but their percentage rose at least 2% to 86% on the question using five cents instead of nickel. The kindergarten went from 5% to 19% and grade one from 46% to 50%.

The Figure Questions, 15-21 Recognizing figures was universal although the circle was easier than the square, probably because of its likeness to the ball. In question 15 the children confused the rectangle with the square which accounts for the higher percentage in question 17.

In the questions on the blocks, practically all children knew the littlest and biggest blocks but the finding of the middle block proved too difficult for all except the second grade, where 79% knew it. Many children thought the littlest block was also the middle block. This percent (84) is a little lower than the percent right (95%) for finding the middle cow. The difficulty may be that the different size blocks were confusing.

Informational Questions 21-27. The question on days in a week showed a very low percentage of right answers (only 69% in grade two). Many children gave five as the number of days in a week. They became confused with the number of school days.

There were all kinds of answers to the question asking how many fingers the child had. A great many children answered five, only counting one hand. A few children answered eight. It could not be determined whether those children were distinguishing the fingers from the thumb. The answer desired was ten and all other answers were necessarily disregarded. This naturally accounts for the lowness of the percentages, which were 29 for kindergarten, 51 for grade one and 63 for grade two.

About 22% of the children knew the size shoe they wore. In questioning a second grade alone, there were 34% who didn't know, so the low percents in the kindergarten (19) and first grade (22) are not surprising.

The children had no idea of the number of rooms in an egg box. Some parents buy eggs in paper bags and it seems that children do not have much experience with eggs except to eat them. They are too expensive and breakable for parents to allow their children to handle them. The children seemed interested in the question, however, for one child went home and found out the answer, reporting to the teacher the next day.

Questions on time 27-31. Of the four questions on time only the second grade went above 75% and only on one question, which asked them when they went to bed, where the percentage was 76. The question about the noon whistle

was most puzzling. Many children marked six o'clock or nine o'clock. They understood the word whistle but didn't get the significance of the word noon. The probable reason for the first time question being the best is that many mothers tell their children to look at the clock at bedtime. This has made them conscious of where the hands are at that time. When they get up and at noon and when they go to school they are not necessarily around a clock. Their attention has not been called to the clock time.

Miscellaneous. Questions 31-39. This group of questions were put in for correlation purposes. The first and second grades both seemed to be intelligent enough to follow the directions. All questions here, except the circle, seemed too difficult for the kindergarten, showing that they were too young. Again, the circle proves the most successful with them (76%) as it did with a previous group. Practically all the questions in this group went 80% or better in the first two grades, showing that they were average children.

Questions 39-46 on Number Recognition. Number recognition is absolutely beyond the kindergarten. 14% could recognize the figure six and, strange to say, a few more (24%) could write thirty-five as coming after thirty-four. There seems to be no reason why they should do this unless because the test was done individually in this grade. 27%

of the children recognized fifteen better than six. This was not true, however, in the first and second grades. They recognized the six more easily than they did the fifteen. Aside from one digit numbers the questions were too difficult for the first grade. Aside from the question on writing three hundred twelve they were all easy enough for the second grade where the percentages were about 80. A lot of children marked fifty-one for fifteen which seems to be a common error among children when they first learn to write numbers. In writing three hundred twelve the children generally put two or more zeros after the three to try and make three hundred: example, 30012. Eighty-nine was a great deal easier because it contained no hundreds. This shows up easier in the percents where the second grade went from 30% to 89%.

Question 46-57 on Directions. Up to filling in the middle cow this group of questions was particularly easy. 95% of the children recognized which pumpkin had the most parts and 96% knew which box had the most dots. 94% recognized two pigs where before they didn't recognize the second duck, that is, in the kindergarten. The word middle here seems to be understood for 88% of the children knew it. The reason for this has been stated before. Another oddity is concerned with the word half. Over 75% of the children were able to divide one house in half but not over 67% of the children could cross out half of the six owls;

this includes even the second grade. It seems that figures over one must be confusing when dividing them in half.

It was surprising the few children that were able to make a line over the pig. The majority of children that got it wrong either put the line through the pig crosswise or up and down. The line under was done much better. This shows that the word under carries a much clearer meaning than the word over.

Number Knowledge, Question 57-60. Here are four questions that are actual arithmetical problems. In these four questions the kindergarten was absolutely lost. They had not the least idea of what to do. The first grade was a little better but their average didn't go over 31%. The second grade did much better, getting 85% on one of the questions. Some of this may be due to the fact that some children had been taught simple addition and subtraction in the last part of grade one. The children, however, did much better on the addition than on the subtraction which again brings up the question of retention. These same children were in the process of being taught simple addition again and this accounts for the higher percentage (over 20% higher) than the subtraction. Both the addition and subtraction were poorer when the examples were placed in a horizontal position. The this includes even the second grade. It seems that figures over one must be confusing when dividing them in half.

It was surprising the few children that were able to make a line over the pig. The majority of children that got it wrong either put the line through the pig crosswise or up and down. The line under was done much better. This shows that the word under carries a much clearer meaning than the word over.

Number Knowledge, Question 57-60. Here are four questions that are actual arithmetical problems. In these four questions the kindergarten was absolutely lost. They had not the least idea of what to do. The first grade was a little better but their average didn't go over 31%. The second grade did much better, getting 85% on one of the questions. Some of this may be due to the fact that some children had been taught simple addition and subtraction in the last part of grade one. The children, however, did much better on the addition than on the subtraction which again brings up the question of retention. These same children were in the process of being taught simple addition again and this accounts for the higher percentage (over 20% higher) than the subtraction. Both the addition and subtraction were poorer when the examples were placed in a horizontal position. The vertical position seems to be the more prevalent.

Changing the line, marking meaningful work from 75% to 65%, correct answers, makes a little more varied conclusions. For the kindergarten it is most surprising to find that only one question falls in the range from 65% to 75%. This question was to put a dot in the square and 66% of the kindergarten knew it. This shows how clearly the kindergarten either knew or didn't know the answers.

In the first grade there are four questions which are in the range from 65% to 75%. They are relating to question number 1, counting to twelve, where the percent was 72, copying a figure, question 31, where the percent was 74, recognizing the number 8, question 43, which was known by 65% of grade one, and the fifty-fifth question on making a line over the pig where the percentage was 71. This means that 65% of the children know how to count beyond nine, can draw more than a circle, recognize numbers, and know over as well as under. This difference in percent from 75 to 65 means only a little broader knowledge of what has before been mentioned, as the above has already shown.

In the second grade seven more items are found to be added to the previous list by changing the basis from 75% correct answers to 65%. The first is the number of days in a week. 69% of the second grade knew this. The second vertical position seems to be the more prevalent.

changing the line, marking meaningful work from 75% to 65%, correct answers, makes a little more varied conclusions. For the kindergarten it is most surprising to find that only one question falls in the range from 65% to 75%. This question was to put a dot in the square and 65% of the kindergarten knew it. This shows how clearly the kindergarten either knew or didn't know the answers.

In the first grade there are four questions which are in the range from 65% to 75%. They are relating to question number 1, counting to twelve, where the percent was 72, copying a figure, question 31, where the percent was 74, recognizing the number 8, question 45, which was known by 65% of grade one, and the fifty-fifth question on making a line over the pig where the percentage was 71. This means that 65% of the children know how to count beyond nine, can draw more than a circle, recognize numbers, and know over as well as under. This difference in percent from 75 to 65 means only a little broader knowledge of what has before been mentioned, as the above has already shown.

In the second grade seven more items are found to be added to the previous list by changing the basis from 75% correct answers to 65%. The first is the number of days in a week. 59% of the second grade knew this. The second question on the shoe sizes showed a percentage of 67, which would qualify it for second grade future work. Another clock question comes under this group. 71% of the second grade knew when to get up. This means that half of the clock questions are known to the second grade. 67% of the second grade could cross out half the owls. This goes along with a previous question on dividing the house in half. This just reinforces the previous question. As in the first grade, question fifty-five on the word over, is 77% for the second grade. Two arithmetic problems on simple addition and subtraction get 68% and 69%, bringing them within the experience circle of grade two.

In looking over the change of ten points we find very little difference between the 75% and 65%. In most cases this second averaging reinforces the first.

Now, in skipping 15 points the line is drawn at 50% to see if the differences will be more varied.

In five cases the kindergarten went over 50% and under 65% in their percents of right answers. The first three cases were the first three counting questions where the percents were 52, 57, 57. This brings all counting questions within the experience of all. The fourth case is copying a figure (32) where the percent was 52. The last case was recognizing the word under (56) where 57% of the kindergarten knew the answer.

In the first grade there are nine new cases. Three of them are on money. 57% knew how many pennies there were in a nickel, 55% knew how much money they spent for an ice cream cone, and 50% knew how much money they had left from five cents when they had spent three. 64% of the children could distinguish the middle block (question 19) and 51% knew how many fingers they had. It was found that on recognizing numbers the first grade is included with 53% knowing the number 15 and 53% knowing the number that comes before nineteen and 53% knowing how to write 89. 60% of grade one could cross out half the owls which again reinforces previous questions on halves.

In the second grade there are only six new cases. These include the cost of bread which 62% of the children knew, the number of fingers which was 64%, recognizing the school milk bottle, which 64% knew, knowing the time for noon whistles, and when to start for school, where 60% knew the first and 65% knew the second, and being able to do simple subtraction which was understandable for 60% of the children.

Again in this last grouping of 50% very little change is found in experience. The changes there are in most cases seem to be just a little broader experience of what they already knew. It would seem from this broader analysis that 75 was the significant point where there is so little change below it.

CHAPTER V

SPECIFIC CONCLUSIONS FOR 75% OF RIGHT ANSWERS

Kindergarten

1. Children can count objects up to ten.
2. Children recognize the simple geometric figures.
3. Children recognize small and large groups.
4. Children can divide an object in half.
5. Children know the difference between largest and smallest.
6. Children know the quart milk bottle.
7. Children know the meaning of the word middle.

Grade One

All conclusions of the kindergarten are true here with the following additions:

1. Children know the meaning of the word under.
2. Children can recognize numbers under six.

Grade Two

All conclusions of the kindergarten and grade one are true here with the following additions:

1. Children can count beyond ten.
2. Children know the meaning of the sixth and tenth.
3. Children know the number of pennies in a nickel.
4. Children recognize the dollar sign.
5. Children know the cost of an ice cream cone.
6. Children know how much milk money they take to school.
7. Children can make simple change.
8. Children know what time they go to bed.

9. Children have enough experience with numbers to tell what comes before and after other numbers.
10. Children can write numbers up to a hundred.
11. Children can do simple addition with the examples arranged vertically.
12. Children can write numbers from dictation.

SPECIFIC CONCLUSIONS FOR CHANGE FROM 75% to 50%

All conclusions for 75% up apply here. It is surprising to find how little change there is.

Kindergarten

1. Children can count through twelve.
2. Children know the meaning of the word under.

Grade One

1. Children can deal with very simple money problems.
2. Children can recognize numbers up to 100.

Grade Two

1. Children know the cost of bread.
2. Children know the number of days in a week.
3. Children know the number of fingers they have.
4. Children know their shoe size.
5. Children know the important hours in their lives.
6. Children can do any simple addition or subtraction problem.

CHAPTER VI

IMPLICATIONS FOR EDUCATION

Kindergarten

Units on counting

Counting games

Block work for geometric figures

Milk unit

Grade One

The same

Units on writing and recognizing numbers

Grade Two

More advanced units on counting

Units on a store using simple change

Simple unit on school banking and saving

Simple unit on time using only the hours. Might be connected up with a health unit.

SUMMARY

It would seem from the present study that very little arithmetic should be taught in the primary grades. This study shows that only very minor aspects of arithmetic can be presented and understood by kindergarten and primary pupils.

These findings are not in agreement with the text books used in our school systems. In the arithmetic text book we find the work much too difficult for the child. Arithmetic is introduced before the child is ready and proceeds at too great a speed. This results in pupil failure.

Sheahan has found in her analysis of a text that there is very incomplete coverage of material that should be taught. She also has found great use of isolated problem work instead of units of work.[1]

Brennan finds that arithmetic text book authors assume that the primary addition facts are taught in Grade Two.[2]

Miss Olive Mahoney in a study being made at the present time at Boston University finds the present arithmetic text books far below the standard of what should be taught as shown by this study.

---

1. Sheahan, Catherine G. Analysis of an Additional Drill Plan in an Arithmetic Text. Boston University School of Education. 1929

2. Brennan, Jane Brooks. An Analysis of the Addition in Book I. The Triangle Arithmetics. Boston University School of Education. 1929

The answer to the question "When should arithmetic be taught and through what approaches?" seems to be partly answered through this study. Only very simple arithmetic such as counting and informational units should be attempted in the kindergarten and primary grades. Suggested units for informational work may be found on page 164. These are compiled from the findings of the test.

This study and others of a like nature will help set up requirements for texts on arithmetic that meet the readiness of the beginner. Until such requirements are set up, arithmetic cannot be expected to improve or can the child learn so readily.

BIBLIOGRAPHY

Baker Mathematics and Intellectual Ability The Mathematic Teacher October 1937

Berman, Etta Referring Systematic Teaching of Arithmetic to Grade 6; an Experiment at Manchester, N. H. Ed. M. Thesis 1935

Bigelow, Elizabeth School Progress of Under Age Children Ed. School Journal XXXV Nov. 1934 p.186-192

Brownell, Wm. A. Readiness and the Arithmetic Curriculum Ed. School Journal Jan. 1938 Vol. XXXVIII No. 5 p. 344

Bruckner, Leo. J. Diagnosis in Arithmetic Thirty-fourth Yearbook of the National Society for the Study of Education p. 269-303

Buckingham, B. R. and Mc Latchy, Josephine Number Abilities of Children when they Enter Grade I. p. 473-524 29th Yearbook of National Society for The Study of Education

Buckingham When to Begin Teaching Arithmetic Childhood Education May 1935 Vol XI No. 8 p. 339-343

Burke, Marjorie Kindergarten Prepares for Reading Success American Childhood Oct. 1933 p. 13 Vol. 19 No. 2

Buswell, G. T. Twenty-ninth Yearbook N.S.S.E. Chapter 3 A Critical Survey of Previous Research in Arithmetic p. 451

Caldwell, Alma B. Arithmetic Without Books p. 15 American Childhood Vol. 17 No. 2 Necessary Arithmetic Skills in Life Situations Oct. 1931

Conner, Wm. L. and Hawkins, Gertrude C. What Materials are Most Useful to Children in Learning to Solve Problems Educational Method 16: 21-29 Oct. 1936

Conner, Wm. L. and Hawkins, Gertrude C. What Material Are Most Useful to Children in Learning to Solve Problems Page 21

BIBLIOGRAPHY, cont.

Deans, Edwina Materials and Methods Childhood Education May 1935 p. 359-366

Dearborn, Walter I. and Peet, Harriet E. Twenty-ninth Yearbook National Society for Study of Education A Test in Arithmetic for Measuring General Ability of Pupils in the First Six Grades p 601-611

Douglas, Harl R. The development of number concepts in Children of Pre-school and Kindergarten Ages Journal of Experimental Psychology December 1935 p/443-470

Fourth Yearbook Department of Superintendents Quotes in Twenty-ninth Yearbook National Society for Study of Education Chapter 2 Social Value of Arithmetic p. 49

Gates, A. I. The Necessary Mental Age for Beginning Reading Educational School Journal p. 497-508 March 1937

Gray, Wm. S. and Freeman, F. N. and Brownell, Wm. A. Vol. XIII No. 9 Childhood Education May 1937 p. 414-421

Gray and Monroe Before We Read Scott Foresman Co. 1937 p. 48

Gruver, Harvey S. Problem Units in Social Arithmetic American Childhood Feb. 1934

Hall, G. Stanley Aspects of Childlife and Education Boston Ginn Co. 1907

Harman, A. F. Working Arithmetic for Beginners p. 12 American Childhood October 1932 Vol. 18 No. 2

Harrison, M. Lucile Reading Readiness Houghton Mifflin 1936

Hildreth, Gertrude Success of Young Children in Number and Letter Construction Child Development March 1932 p. 1-14

Hildreth Arithmetic Readiness Journal of Experimental Education Sept. 1935 Vol. 4 No. 1 p. 1-7

BIBLIOGRAPHY, cont.

Jacobs, Nina Personality Development and Adjustment through Number Childhood Education Vol. 13 No. 6 p. 258-261

Mac Latchy, Josephine Number Abilities of First Grade Children Childhood Education May 1935 Vol. XI No. 8 p. 344-347

Mc Laughlin, Katherine Number Abilities of Pre-school Children Childhood Education May 1935 Vol. XI No. 8 p. 348-353

Metropolitan Readiness Tests World Book Company Yonkers on Hudson 1933

Meumann, Ernest Number Concepts of Children Entering School Twenty-Ninth Yearbook of National Society for the Study of Education

Morton, R. L. The Place of Arithmetic in the Curriculum of the Primary Grades Foundations in Arithmetic Bulletin of the Association for Childhood Education, 1201 16th Street, Northwest, Washington, D. C. p. 6-7

Rich, Frank M. Project Arithmetic Small Numbers and Combinations American Childhood Oct. 1934 Vol. 20 No. 2 p. 16

Rich, Frank M. Project Arithmetic The Counting Habit American Childhood Sept. 1934 Vol. 20 No. 1 p. 13

Smith, Nila B. Elementary School Journal April 1934 p. 621-626

Smith, Nila B. Arithmetic in the Out of School Life of First Grade Children Elementary School Journal 24 p. 621-627

Stone Reasoning Tests in Arithmetic Bureau of Pub. Teachers' College, Columbia University New York

Sheahan, Catherine G. Analysis of an Additional Drill Plan in an Arithmetic Text. Boston University School of Education. Ed. M. Thesis 1929

BIBLIOGRAPHY, cont.

Sueltz, Ben. A. Arithmetic Readiness and Curriculum Construction Mathematic Teacher October 1937 p. 290

Taylor, Joseph S. Omitting Arithmetic in First Year Ed. A. & Supr. Feb. 1916 p. 87-93

Thiele, C. L. and Sauble, Irene Vacation Arithmetic for the Third Grade American Childhood Vol. 16 No. 10 June 1931 p. 19

Thiele and Sauble Arithmetic Mastery for Advanced Third Grade American Childhood Feb. 1931 p. 24

Thiele and Sauble, Irene The Third Grade Masters Arithmetic Tables American Childhood Vol. 16 No.9 May 1931 p. 22

Washburne, Carleton When Shall we Begin to Teach Arithmetic Elementary School Journal May 1928 p. 659-665

Wesley, Marion J. Social Arithmetic in the Early Grades Childhood Education May 1935 p.367-372

Wilson, Guy M. Number Experience Grades 1 and 2 American Childhood January 1936 Vol. 21 No. 5 p. 15

Wilson, Guy M. Third Year Book Department of Superintendents Chapter 3 Arithmetic p. 35

Wilson, Guy M. New Standards in Arithmetic J. Ed. Res. 22: 351-60 Dec. 1930 (Miss Greenwood's Experiment in Lawrence)

Wilson, Stone, Dalrymple The Teaching of Arithmetic In Press (The writer had access to this manuscript)

Woody, Clifford Arithmetic Backgrounds of Young Children Journal of Educational Research 24 p. 188-201

Brennan, Jane Brooks An Analysis of the Addition in Book I. The Triangle Arithmetics. Boston University School of Education. B.S. in Ed. Thesis 1929

BOSTON UNIVERSITY
1 1719 02554 7508